

ECOL 4000/6000 Population and Community Ecology

Fall 2018

Time: Tu Th 2.00 – 3.15 pm. (3 credit hours)

Place: Science Learning Center, Room 345

Instructors: John Drake, Ph.D. & Andrew Park, Ph.D.

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Office hours: By appointment

Overview

Population and community ecology are active fields of research with important applications for management and conservation. This course links conceptual issues and basic models with data and field approaches relevant for understanding population dynamics in time and space. The first third of the course focuses on the birth, death, and movement of organisms, with particular reference to the population dynamics of single-species; the middle third of the course focuses on interactions among species, including competition and predation; the final third of the course focuses on the causes and consequences of diversity (the co-occurrence of multiple species).

Format

The course format includes lectures, demonstrations, exercises, discussions, group activities and homework assignments. Throughout the semester, students will work on group projects (typically in one class period per week).

Text

Readings (in the form of chapters) will be uploaded to the course website (<http://courses.ecology.uga.edu/ecol4000-fall2018>) approximately one week before the associated lecture topic, along with occasional readings from the primary literature. Reading of posted material prior to coming to class is essential, and short quizzes will be given at the beginning of class.

Group work

Students will be assigned to small groups and will work together through the semester developing and answering research questions related to the population and community ecology of natural systems. Students will work with real data sets and, in consultation with instructors, will develop written reports detailing student contributions. In addition, a summary of findings will be presented to the class towards the end of the semester.

Prerequisites

This course assumes you are familiar with general ecology and biology, and have taken ECOL 3500.

Attendance

Attendance is essential. If you miss a class, you are responsible for contacting fellow students for lecture notes. More than 4 unexcused absences will result in a lowering of your final score by one letter grade. An excused absence is constituted by the student notifying the instructor in advance and producing proof for reason of absence immediately upon return to the class.

Evaluation

Short quizzes (which cannot be made up) will be given at the beginning of each class period for which there is a reading assignment. Additionally, there will be approximately ten homework assignments. There will be two exams during class periods (September 14th & October 24th) and a final exam on December 7th (3:30-6:30pm).

Grade calculation

10% Quizzes	15% Homework
10% Exam 1	10% Participation
10% Exam 2	15% Written report of group project 1
15% Final exam	15% Presentation of group project 2

Accommodations

Please contact the instructor if you require special accommodations due to learning disabilities, religious practices, physical or medical needs, or for any other reason.

General Notes

- (i) All academic work must meet the standards contained in "A Culture of Honesty." Students are responsible for informing themselves about those standards before performing any academic work. The link to more detailed information about academic honesty can be found at: <http://www.uga.edu/honesty/>
- (ii) The course syllabus is a general plan for the course; deviations announced to the class by the instructors may be necessary.

Syllabus outline

Date	Topic (short lecture topic in parentheses)	Theme
08/14/18	Scientific computing I	Population ecology
08/16/18	Scientific computing II	
08/21/18	Population growth and decline	
08/23/18	<i>Group project work: Population dynamics (Density dependence)</i>	
08/28/18	Complex dynamics	
08/30/18	<i>Group project work: Population dynamics (Extinction)</i>	
09/04/18	Age structure	
09/06/18	<i>Group project work: Population dynamics (Metapopulations)</i>	
09/11/18	<i>Group project work: Population dynamics (Ecosystem engineering)</i>	
09/13/18	Exam 1	Species interactions
09/18/18	Lotka-Volterra competition	
09/20/18	<i>Group project work: Population dynamics (Host-parasitoid)</i>	
09/25/18	R* theory of competition	
09/27/18	<i>Group project work: Population dynamics</i>	
10/02/18	Predator-prey dynamics	
10/04/18	<i>Group project work: Biodiversity (Host-parasite)</i>	
10/09/18	Paper discussion: Hare-Lynx interactions	
10/11/18	<i>Group project work: Biodiversity (Indirect interactions)</i>	
10/16/18	Trophic cascades	
10/18/18	<i>Group project work: Biodiversity (Niche theory)</i>	
10/23/18	Exam 2	
10/25/18	<i>Group project work: Biodiversity (Latitudinal diversity gradients)</i>	
10/30/18	Measuring biodiversity	
11/01/18	<i>Group project work: Biodiversity (Species-abundance distributions & species-area curves)</i>	
11/06/18	Island biogeography	
11/08/18	<i>Group project work: Biodiversity</i>	
11/13/18	Neutral theory of biodiversity	
11/15/18	Biodiversity and ecosystem function	
11/20/18	Thanksgiving	
11/22/18	Thanksgiving	
11/27/18	Review	
11/29/18	<i>Group presentations</i>	
12/11/18	Exam 3 - 3:30-6:30pm	