ECOL 4000/6000 Population and Community Ecology
Fall 2016

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.
Email: jdrake@uga.edu, awpark@uga.edu

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 readings, quizzes, 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 (textbook chapters and primary literature) will be uploaded to the course website (http://courses.ecology.uga.edu/ecol4000-fall2016/) approximately one week before the associated lecture topic. Reading of posted material prior to coming to class is essential, and short quizzes will be given at the beginning of class.

The bibliography of additional readings is provided at the end of this syllabus.

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 a natural ecosystem. Students will work with data sets from real research 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 13th & October 25th) and a final exam on December 13th (3:30-6:30pm).

Grade calculation

10% Quizzes	10% Homework
10% Exam 1	10% Participation
10% Exam 2	30% Written reports of group projects
10% Final exam	10% Presentation of groups project findings

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.

Bibliography of additional readings

Emery, S. (2012) Succession: a closer look. *Nature Education Knowledge* **3**, 45.

Krebs, C.J., Boutin, S., Boonstra, R., Sinclair, A.R.E., Smith, J.N.M., Dale, M.R.T., Martin, K. & Turkington, R. (1995) Impact of food and predation on the Snowshoe hare cycle. *Science*, **269**, 1112–1115.

Optional chapter readings: 7, 11, 17, 20

Outline of topics

Date	Topic	Reading	Theme
08/11/16	Introduction		Population ecology
08/16/16	Scientific computing I		
08/18/16	Scientific computing II		
08/23/16	Population growth and decline	1	
08/25/16	*Group project work: Population dynamics*	2	
08/30/16	Density dependence	3	
09/01/16	*Group project work: Population dynamics*	4	
09/06/16	Age structure	5	
09/08/16	*Group project work: Population dynamics*	66	
09/13/16	Exam 1		
09/15/16	*Group project work: Population dynamics*		Species interactions
09/20/16	Lotka-Volterra competition	8a	
09/22/16	*Group project work: Species interactions*		
09/27/16	*R** theory of competition	8b	
09/29/16	*Group project work: Species interactions*		
10/04/16	Predator-prey dynamics	9	
10/06/16	*Group project work: Species interactions*	10	
10/11/16	Paper discussion: Hare-Lynx interactions	Krebs et al. 1995	
10/13/16	*Group project work: Species interactions*	12	
10/18/16	Trophic cascades	13	
10/20/16	*Group project work: Biodiversity*	14	
10/25/16	Exam 2		
10/27/16	*Group project work: Biodiversity*	15	Community ecology
11/01/16	Measuring biodiversity	16	
11/03/16	*Group project work: Biodiversity*	Emery 2012	
11/08/16	Species-abundance distributions and species-area curves	18	
11/10/16	*Group project work: Biodiversity*		
11/15/16	Neutral theory of biodiversity and metacommunities	19	
11/17/16	Diversity-function-stability relationships	21-22	
11/22/16	Thanksgiving		
11/24/16	Thanksgiving		
11/29/16	*Group presentations*		
12/01/16	Review and exam preparation		
12/13/16	Exam 3 - 3:30-6:30pm		