Community Ecology - Spring 2011

What is community ecology?	Community ecology is the study of biotic communities—the species currently living near each other and which form a logical unit. It aims to understand how those species got there, their characteristics, and how they interact. Community ecology deals with ecology at a scale intermediate between the level of population biology and that of biogeography or ecosystem ecology. That means it is vague enough to be either really exciting or really frustrating. To me, that's exciting; it means that there is enormous opportunity to do groundbreaking work for anyone who is creative enough and has the tools to attack the problem. I hope by the end of the semester that you'll have the tools.
Instructor	Alison Boyer – alison.boyer@utk.edu Office: 447 Hesler Email is a great way to get in touch with me.
Office hours	MW – 3:00-4:00, other times by appointment only.
Class	Room 412 Buehler MWF – 11:15 -12:05
Course communication	A Blackboard site will be up soon. Readings and other interesting things will be posted there. Also, check your email often for important announcements and papers.
Course goals	By the end of this course, you will (1) Be familiar with the main ideas and history of thought in community ecology. This course is not meant to be a survey of every idea that has reared its ugly head in community ecology, but we will explore some ideas in more depth than others. (2) Develop your writing and thinking skills. You will write a lot in this class because writing helps clarify your thoughts, and we all need more clear thoughts. The writing assignments will ask you to synthesize ideas, to dig deeper into a field, or to apply what you've learned earlier in the semester. (3) Learn some tricks of the trade that all practicing ecologists rely on. Part of our 'lecture' time will actually be spent in the lab developing your toolkit. In addition, you'll get some time at the end of the semester to practice community ecology in the field.
How will we achieve those goals?	This is not a lecture course. Instead, you will engage the primary literature. Prior to most classes, you will read 1-3 papers on a particular subject and come to class prepared to critique the papers. Nearly every class meeting, you'll post a question based on the reading on the course blog. Approximately weekly, you'll also provide an answer, written in paragraph form, to a question we provide. We may ask a few students to read their paragraphs aloud at the beginning of each class to spur discussion. Mondays will generally be "lecture" days, and you might have read a book chapter or review article. Wednesdays and Fridays will generally be discussion/lab exercise days, and you will do hands-on ecology or discuss the primary literature.
Evaluation	Participation (100 points): You must invest in your own learning by critically reading the assigned papers, thinking deeply about them, and being willing to discuss them in class.

Paragraphs and questions (150 points): Paragraphs will be graded for clarity, brevity, and completeness. Questions will be graded for originality and thoughtfulness.
Exams (150 points): There are two take-home exams in this class - one in the middle of the term (the week before spring break) and one at the end of the term. Each exam is worth 75 points.
Final Project (50 points): The final project will be based on a field trip we'll take in April to the Smoky mountains. If you can't take off for 2 nights and 3 days, then you can write a 15 page NSF-style research proposal.

Reading scientific articles

Articles can be full of specialized jargon and complex statistics. Do not get hung up on these details. It is more important to have read the whole paper and have a general understanding of it than to have read only part of it in excruciating detail. Begin by reading the abstract, introduction, conclusion, and look at the figures. Then go back and read the entire article.

Come to class prepared to answer the following questions about each paper:

- What is the big question or issue this work addresses?
- What was the hypothesis?
- What did the author do to test this?
- What did the author find?
- What did you think about the study and the paper?

If you can answer these questions in 1-2 sentences, you are doing fine.

Schedule of topics

Note that this schedule is subject to change as our interests evolve or at the whim of your instructor.

Week	Date	Topic	Reading	Assignments
1	12 Jan	Introduction to course		
	14 Jan	L: A brief tour of Community Ecology	Vellend (2010)	
2	17 Jan	No class: MLK Jr. Day		
	19 Jan	D: Are there general laws in ecology?	Lawton (1999), Simberloff (2004)	Paragraph due: Rules
	21 Jan	A tour of the primary literature (Computer lab)	MacArthur (1958)	
3	24 Jan	TBA – instructor out of town		
	26 Jan	D: Has MacArthur (1958) stood the test of time?		Web of Science assignment due
	28 Jan	L: Doing ecology (methods)	Connell (1961)	
4	31 Jan	L: Competition & the niche	Pacala & Roughgarden (1982)	Post Q on Bb
	02 Feb	D: competition / character displacement	Brown & Davidson (1977)	Paragraph due: Competition
	04 Feb	L: Predation / parasitism	Brooks & Dodson (1965)	
5	07 Feb	D: Mutualism & indirect interactions	Palmer et al (2008), Kauffman et al (2010)	Post Q on Bb
	09 Feb	Indirect interactions (Computer lab)		Find a paper on indirect interactions
	11 Feb	D: What is your favorite indirect interaction?		Paragraph due: indirect interactions
6	14 Feb	L: Describing communities (diversity & rarefaction)		
	16 Feb	Describing communities (Computer lab – rank-abund plots)	Stevens & Willig (2002)	
	18 Feb	L: Describing communities (beta-diversity, similarity & homogenization)		
7	21 Feb	Describing communities (Computer lab-diversity indices & t-tests)	Olden & Rooney (2006)	Post Q on Bb
	23 Feb	Describing communities (Computer lab)	McKinney 2004	Answer a Q on Bb
	25 Feb	Describing communities (Computer lab)	Buckley & Jetz (2008)	Post Q on Bb
8	28 Feb	L: Coexistence and community structure		Paragraph due: grassland birds results
	02 Mar	L: Null models and community structure	Connor & Simberloff (1979)	
	04 Mar	D: Is there evidence for non-random		Find a paper on

		community structure?		community structure
9	07 Mar	Community structure: Intro to EcoSim		Paragraph due: Community structure
	09 Mar	Assign midterm		
	11 Mar	*Mid-term exam due by 12:15 pm*		
10	14 – 18 Mar	Spring Break		
11	21 Mar	L: Phylogenetic and functional community structure		Find a dataset to analyze with EcoSim
	23 Mar	D: Phylogenetic community structure	Graham et al. (2009) PNAS	Post Q on Bb
	25 Mar	L/D: Functional diversity and functional community structure		Post answer on Bb
12	28 Mar	Community structure analysis using EcoSim		
	30 Mar	Community structure analysis using EcoSim		
	01 Apr	L: Niche theory vs. Neutral theory	Hubbell (2005)	Paragraph due: EcoSim assignment
13	04 Apr	L: What to do on the field trip? GSMNP and possibilities		
	06 Apr	L: Energy, climate, and biodiversity	Wright (1983)	Post Q on Bb
	08 Apr	Guest Lecture: Niche & Neutral Thsory		
14	11 Apr	D: Diversity patterns	Kreft & Jetz 2007	Field trip project plan due
	13 Apr	D: What to do on the field trip? Designing an ecological study		
	15 Apr	*No class – Field Trip*		
15	18 Apr	L: Metabolic Theory & Macroecology		Find a paper on MTE
	20 Apr	D: Metabolic Theory & Macroecology	Present the paper you chose to the class	
	22 Apr	*No class – Spring Recess*		
16	25 Apr	L: Applications of Community Ecology (invasives, biocontrol, climate change)	Sanders et al. 2003	Post a Q on Bb
	27 Apr	L: Applications of Community Ecology (conservation and restoration)		
	29 Apr	D: Applications (designing communities); Review		Final project report due
	06 May	*Final exam due by 12:15 pm*		

Any student who feels that she or he may need accommodations for any physical or learning disability, please speak with me after class, stop by during office hours, or make an appointment to see me.