

# Aquatic Ecology - EEB 470 - Syllabus 2014

## Course Details

Aquatic Ecology is an upper division course with particular emphasis on the biotic component of lake, stream, riverine and marine ecosystems. All with an eye toward the constraints imposed by life in an aqueous environment. This is a conceptually and theoretically based course spanning the breadth of ecology with reference to evolutionary processes. The course progresses in scale from the dynamics of populations through interspecific interactions to communities and ecosystems. Some simple computer modeling and a good deal of primary literature reading are required. The syllabus is organized in a topical fashion reflecting increasing scale. Please note that lecture dates are tentative.

While the studies we discuss here are surely an important aspect of the course, the particular details of any given study are far less significant than the ideas, concepts and theories that they address. In this class we are developing an intellectual framework that permits us to think about how nature works. But how does one build such a framework? Why not just give us the facts and outline what needs to be committed to memory for exams? You've had enough of that. Memorization is of very little use per se. Unfortunately, the prevailing approach to education remains based on rote memorization. The result is a neural network (yours) laden with details but lacking in the ability to synthesize those details into ideas and concepts. I hope to correct this by helping you develop this broadly-based and synthetic framework from which you can approach and understand nature at any level of organization you choose.

## Exams/Grades

Course grades are based on two midterm exams and a final. These exams have equal weight and comprise 90 % of the grade. Various assignments and simulation projects comprise the remaining 10 % of the grade. Exams in this course contain several distinct styles of question. First, there are the inevitable multiple choice questions, but with a serious twist on that theme. You have the opportunity to explain why you chose a particular answer. Next are questions that require both interpretation and creativity. Some questions target differences in spatiotemporal scale, asking you to bridge levels of organization or ecological and evolutionary time scales. These questions typically involve one or more studies that we have discussed in class, but I'll not simply ask what did so-and-so show in that study. Rather, I'll change the environmental scenario, for example, and ask how results of the study would change.

Questions you will not find on my exams:

- a. Definition questions. Instead, the questions assume you already understand the words.
- b. Questions whose answer requires simple memorization.
- c. Little circles that you must darken with a No. 2 pencil, where one and only one correct answer is acceptable. The problem with little circles is the fact that nature is far too complex to be so exactly solvable.

University rules and regulations can be found in HillTopics.

## Tentative Lecture Schedule

<u>Date</u>	<u>Topic</u>	<u>Readings</u>
08-22	Introductory fanfare	
08-27	A graphical model	
08-29	Origins of lake basins	
09-03	Seasonal dynamics and turnover	Hutchinson
09-05	River continuum hypothesis	Vannote
09-10	The creatures	
09-12	The lake as a microcosm	Forbes
09-17	How nature works	Bak
09-19	A systems-based framework	Drake
09-24	Systems extended	
09-26		
10-01	Exam I	
	Competitive Interactions I	Paine
10-03	Competitive Interactions II	Connell
10-08	Competitive Interactions III	Brooks & Dodson
10-10	Competitive Interactions IV	
10-15		
10-17	Predation I	Werner & Hall
10-22	Predation II	Peckarsky
10-24	Predation III	Sih
10-29	Predation IV	
10-31		
11-05	Exam II	
	Community concepts	Samuels and Drake
11-07	Top-down and bottom-up controls	Carpenter
11-12	Experimental and theoretical studies	
11-14	Experimental and theoretical studies II	
11-19	Community assembly mechanics	Drake
11-21	Ecosystem constructs I	Carpenter
11-26	Ecosystem constructs II	
11-28	Final	