

# Biology 476, Spring 2015

## Functional Ecology

**Overview:** The course uses a combination of lectures, readings, and student presentations (literature synopses). I'll try to tailor the topical coverage a bit to reflect interests of the students. To a large extent, the degree of benefit students derive is correlated to the degree of effort devoted to exploring topics of individual interest through reading and studying beyond the minimum required.

Course materials and PDFs of readings are available on the Blackboard page for the course.

Lectures will provide some historical context and general background for course topics, to allow students to understand materials covered in more detail in the readings.

The course will utilize multiple sources for readings. We will use many articles from the primary literature and some book chapters. For each major topic, there will be one or more required readings plus a list of optional readings. The optional readings are to allow you to explore your individual interests in more depth.

Student presentations will be synopses of a reading chosen from the provided reading lists (or from another approved source). Student will use different readings; selections must be confirmed by the instructor, to avoid duplication. Presentations should be ~10-15 minutes long, depending on the complexity of the reading, and should summarize and explain key issues. For experimental studies from the literature, presentations should include questions addressed, methods, results, and conclusions. For other readings such as book chapters, a presentation should focus on summarizing and explaining the major topics covered in the chapter. In all cases, presentations should try to relate the specific reading to the relevant general topics covered in lecture. Visual aids such as tables and figures from the reading presented via Powerpoint are usually helpful. Try to identify the author(s), to whatever degree possible. Each student will do four presentations over the semester (or possibly three, depending on how time goes...).

Graduate students in EEOB 576 have an additional course component; they act as reviewers of a manuscript submitted for publication.

## Grading

	Biol 476	EEOB 576
Hour Exam I	20%	20%
Hour Exam II	20%	20%
Final Exam	30%	25%
Literature synopses	30%	20%
Manuscript review		15%

The exams will be essay format, take-home exams with about 8-10 short answer/longer essay questions. You will have approximately 1 week to complete each exam. They will be spaced at intervals of approximately 1/3 of the semester; exact dates will be determined by when we have a convenient break between topics. Course grade cutoffs based on total points will be 90%--A-, 80%--B-, 70%--C-, 60%--D-, <60%--F (with +/- subdivisions).

If you have a documented disability and anticipate needing special accommodations, please meet with the instructor privately after obtaining a Student Academic Accommodation Request form from the Disability Resources office (1076 Student Services Building).

## Learning Objectives: Students will

- learn the history of the field of functional ecology and some of the leading ecologists in the field.
- read both classic and recent papers in the field of functional ecology and be able to integrate information and concepts from them.
- gain practice in analyzing and summarizing articles in the primary literature and giving presentations relating these to topics covered in lecture.

--be able to relate physical principles regulating interactions with the environment to the physiology and structure of organisms and, ultimately, their distributions.

--gain a basis for predicting the responses of organisms to climate and future changes in climate

## Course topics

<u># hours</u>	<u>Topic</u>
1	Historical background
1	Development of concepts
2	General adaptive processes
1	Nature of the environment
5	Biophysical ecology
6	Biomechanics
1	Exam I
1	Effects of size
1	Water physiology--basic concepts
2	Photosynthesis--basic concepts
2	Evolutionary patterns in plant carbon metabolism: C <sub>3</sub> , C <sub>4</sub> , CAM
1	Stable isotopes
1	Acquisition of resources
	Responses to:
3	Light
3	Water
1	Exam II
2	Nutrients
3	Temperature
1	Carbon dioxide
3	Perceptory systems and behavior
1	Nitrogen-photosynthesis relationships
	manuscript review due
1	Historical/geological effects
2	CO <sub>2</sub> , climate change
	Morphogenesis
	Defensive mechanisms
	Leaf lifespan; evergreenness; deciduousness; sclerophylly
	Dynamic light environments
	Final Exam