

Biology 311/511, General Principles of Organic Evolution

Course overview

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Office hours	11:00-11:45 MTWRF, if the door is open, or by appointment

Statement on Evolution by the Society for the Study of Evolution (www.evolutionsociety.org)

“Evolution” refers both to a set of scientific facts and to a theory explaining such facts. “Evolution” refers to the scientific fact that biological organisms have changed through time, and that all life, including humanity, has descended with modification from common ancestors. Evolution is as well documented as are other currently accepted scientific facts. The theory of evolution is a comprehensive and well-established scientific explanation, based on natural processes, of the fact of biological evolution.

Course description

An overview of organic evolution as the unifying principle of the biological sciences, with coverage of the various theories of evolutionary biology, the origins of evolutionary thought, population genetics, systematics, and paleobiology. Includes laboratory projects on topics such as population genetics, morphometrics, and phylogeny reconstruction.

Class goals

- Gain an appreciation of the history of evolutionary biology (from early theories to modern synthesis and incorporation of molecular techniques) and its significance as a unifying concept in biology.
- Develop an understanding of the questions that evolutionary biologists study, the methods used to study them, the fundamental lessons learned, and what still remains unresolved.
- Improve your writing and speaking skills, particularly your ability to organize and communicate your ideas pertaining to evolutionary biology to scientists and non-scientists alike.

Important information

This course will be a blend of lectures and discussion groups. Readings will be primarily from the required text (Evolution, 2nd Ed., D. J. Futuyma, 2009) as well as relevant scientific literature (which will be provided as needed). I highly recommend that you read the chapters prior to class so you will have an idea what I am talking about.

Assignments are due *AT THE BEGINNING OF CLASS* on the appointed day (unless otherwise noted on the course schedule). Late assignments will lose 10% each day (including the day they are due [thus, assignments turned in at the END of class are “late”]) that they are late (that is, something turned in late loses 10% the first 24h, 20% the second 24h, etc). There will be no make-up work unless the absence was excused and/or documented. There is no extra credit planned at this time.

Course evaluation:

Your grade in this course will be based on the following components (totaling 900 pts.):

Attendance/ participation	Quizzes/ assignments	Project outlines	1 st drafts	2 nd drafts	Peer reviews	Final projects	Term exams (3)	Comprehensive final exam
70 pts.	100 pts.	10 pts.	30 pts.	60 pts.	30 pts.	100 pts.	100 pts. ea.	200 pts.

Attendance / Participation

Class attendance is expected. Class participation will include your contribution to lectures (including asking questions) as well as occasional discussions of lecture topics and outside readings.

Quizzes / Assignments

To ensure that you are keeping up on the material, there will be a quiz or an assignment nearly every week covering that week’s material (the only exception are week’s that have an exam scheduled). If there are more than 10 quizzes or assignments, your lowest score(s) will be dropped.

Class Projects

You (and a team of peers) will research a topic of your choosing and write a review summarizing the *scientific* literature on this topic. This assignment should be as if submitting to the journal “Evolution” and you should follow the journal style guidelines *STRICTLY*. The project includes an outline of the areas to be researched, a draft to be edited by me, a second draft to be peer-edited (for which both your drafts and your reviews will be graded), and a final draft. Deadlines are listed on the course schedule. For these assignments *ONLY* the peer-reviewed literature is acceptable source material. If you are unsure of whether something is an appropriate source, please ask.

Term Exams

There will be three term exams at roughly equal intervals. These will cover material from the lectures and will not be comprehensive (though ideas do build in a course such as this). Exams will be composed primarily of short-answer questions that stress comprehension.

Final Exam

The final exam will be similar to other exams (see above), but will be comprehensive with roughly half the exam covering the first three quarters of the semester and one half covering the last quarter.

Final Grades

Your final grade is based on the percentage of points that you earn.

≥93% = A, ≥90% = A-, ≥87% = B+, ≥83% = B, ≥80% = B-, ≥77% = C+, ≥73% = C, ≥70% = C-, ≥67% = D+, ≥60% = D, <60% = F

In-Class Behavior

You are expected to be respectful & considerate of your fellow students’ learning environment. In addition, you are expected to focus on the topics of the day in lectures. Thus, certain electronic devices are considered by me to be distractions & not allowed in the classroom. Primary among these are cell phones & computers. *All cell phones* are to be silenced & put away during class. No texting, no calls, no exceptions (I may not say anything at the time, but you should expect your participation grade to be affected negatively if you violate these guidelines). Unless you have a documented learning disability that requires a laptop to take notes, there are to be no computers during lectures. During lectures we may engage in periodic discussions of relevant issues. You are not required to *agree* with every opinion expressed by me or your peers (in fact, healthy skepticism is to be expected of any good scientist), but you should respect the right of others to hold different opinions & perhaps even learn from their viewpoints. You are expected and encouraged to ask questions & participate in discussions where appropriate (remember part of your grade depends on class participation).

Disabilities

UWSP abides by interpretations of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 that stipulates no student shall be denied the benefits of an education “solely by reason of a handicap.” Disabilities covered by law include, but are not limited to, learning disabilities, hearing, sight, or mobility impairments, and other health related impairments. If you have a documented disability that may have some impact on your work in this class for which you may require accommodations, please see me during the first two weeks of the semester so that such accommodations may be arranged.

Academic Integrity

Plagiarism and cheating of any form are serious offenses and may result in an F for the assignment, the course, or expulsion from the university. The details of the UWSP Academic Integrity policy are found in the Student Handbook. It is your responsibility to read and understand the contents of that policy before you submit work to be graded. Questions regarding the policies and enforcement of the policies may be addressed to me during office hours.

Notification of Participation in College Sanctioned Events

Individuals who must miss a class to participate in a college-sanctioned event are expected to notify me in advance and complete the work, including tests, in advance. It is your responsibility to communicate with me in advance regarding absences and determine a schedule for make-up work.

Fall 2012; Biology 311/511
Principles of Organic Evolution

Class Schedule
(This schedule is tentative)

Week	Day	Date	Class Topic	Reading	Due Dates
1	W	Sept. 5	History of Evolutionary Ideas	1	
1	F	Sept. 7	The Tree of Life	2	
2	M	Sept. 10	Phylogenetics	2	
2	W	Sept. 12	Evolutionary Patterns	3	
2	F	Sept. 14	Phylogenies and Patterns	3	
3	M	Sept. 17	Geology and Fossils	4	
3	W	Sept. 19	Fossil Record and Evolution	4	
3	F	Sept. 21	A Brief History of Life	5	Project Outlines (5pm)
4	M	Sept. 24	Biodiversity	7	
4	W	Sept. 26	Extinction	7	
4	F	Sept. 28	Genetic Variation	8	
5	M	Oct. 1	Mutation	8	
5	W	Oct. 3	EXAM 1		
5	F	Oct. 5	Phenotypic Variation	9	
6	M	Oct. 8	Genetic Variation in the Wild	9	
6	W	Oct. 10	Adaptation	11	
6	F	Oct. 12	The Nature of Natural Selection	11	
7	M	Oct. 15	Modes and Models of Selection	12	
7	W	Oct. 17	The Outcomes of Evolutionary Change	12	
7	F	Oct. 19	Genetic Drift	10	Project 1 st Drafts (5pm)
8	M	Oct. 22	Neutral Theory of Evolution	10	
8	W	Oct. 24	Evolution of the Phenotype	13	
8	F	Oct. 26	Quantitative Genetics	13	
9	M	Oct. 29	Life-history Evolution	14	
9	W	Oct. 31	Evolution of Trade-offs	14	
9	F	Nov. 2	EXAM 2		
10	M	Nov. 5	Evolution of Sex	15	
10	W	Nov. 7	Sexual Selection	15	
10	F	Nov. 9	Conflict and Cooperation	16	
11	M	Nov. 12	Evolution of Behavior	16	
11	W	Nov. 14	What are Species?	17	Project 2 nd Drafts (5pm)
11	F	Nov. 16	Genetic Basis of Speciation	17	
12	M	Nov. 19	Modes of Speciation	18	
12	W	Nov. 21	Consequences of Speciation	18	
			Thanksgiving Break		
13	M	Nov. 26	Coevolution	19	
13	W	Nov. 28	Molecular Evolution	20	
13	F	Nov. 30	Genes and Genomes	20	
14	M	Dec. 3	EXAM 3		
14	W	Dec. 5	Evolution and Development	21	
14	F	Dec. 7	Major Biogeographic Patterns	6	Project Final Drafts (5pm)
15	M	Dec. 10	Phylogeography	6	
15	W	Dec. 12	Macroevolution	22	
15	F	Dec. 14	Evolution and Society	23	
	W	Dec. 19	COMPREHENSIVE FINAL EXAM: 14:45-16:45		