Biology 18: Adaptation and the Organism **Spring 2011**

Professors:
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Julie A. Emerson, LSB 322, x8381, jemerson@amherst.edu, office hours: Wed/Thurs 11:30-12:30 (also available by appointment)

Lecture: MWF 9:00-9:50 AM, Mead (Stirn) 115

4th hour: meets occasionally on Tuesdays from 1:00-1:50 PM, Mead (Stirn) 115

Laboratory: Life Sciences Building 234, TuWTh 2:00-5:00 PM and Th 8:00-11:00 AM

Required readings: Sadava et al., *Life: The Science of Biology,* 8th edition (available for purchase at Amherst Books and on-line vendors, and on reserve in the Science Library); occasional additional readings will be made available in class or electronically via the course E-reserves page.

Course requirements and grades: Two-thirds of your final grade will be based on the lecture component of the course and one-third based on the laboratory component. The lecture component includes three 50-minute, in-class exams and one final exam. Exams are not cumulative and will be weighted proportional to the number of lectures covered by each exam. Problem sets, designed to help you practice the more difficult concepts, will also be graded. The laboratory component of your grade will be determined by your performance on a variety of laboratory assignments, which include on-line pre-lab quizzes, written reports and an exam. Laboratory assessments will not all carry the same weight - for example, the comprehensive animal lab practical exam will count about four times as heavily as the plant and fungi essay. Attendance in weekly laboratory sections is mandatory and grades will be negatively impacted by absences. Late lab assessments or problem sets will be subject to grade penalties that increase each day that they are late. Note: make-up assignments or exams will not be given unless there is approval from the Dean of Students Office.

Intellectual responsibility: Academic dishonesty will not be tolerated and will be reported to the Dean of Students. Make yourself aware of the College's *Statement of Intellectual Responsibility* (http://www.amherst.edu/~dos/conduct/rightsrespon.html). While you are permitted (and encouraged!) to discuss laboratory concepts and results with your lab instructors and other students, ***the lab assessments are to be the products of each individual student's efforts.*** Except for joint assignments with your lab partner, no paper or electronic copies of lab reports should be shared between Biology 18 students, either current or previously-enrolled in the course. If you do obtain information from other sources (person, article, book, Web site, etc.), you ***must*** identify the source. Identical sentences or paraphrased paragraphs that are uncited will be taken as evidence of copying the work of others and handing it in as your own. Anyone found to have done this, or to have used outside sources of information during exams, will be reported to the Dean of Students and will receive a minimum penalty of an F on that assignment or exam.

Wk	Date		Lecture topics	Readings		Laboratory
1	Jan 24	M	Course mechanics; Why organismal biology?		MH/EC	Lab check in and lab safety
	26	W	History of evolution and ecology	Chapter 1	MH	
	28	F	Systems of inheritance	Chapter 10.1	MH	
2	31	M	Population genetics	Chapter 22.1	MH	Goldenrod gall lab – week 1 *(complete on-line quiz before lab)*
	Feb 2	W	Mechanisms of evolution	Chapter 22.2	MH	
	4	F	Species concepts	Chapter 23.1	MH	
3	7	M	Speciation, hybridization, and extinction	Chapter 23.2, 23.3	MH	Goldenrod gall lab – week 2 *(read assigned paper before lab)*
	8	T	Review of problem set and for Exam I		MH	
	9	W	**EXAM I**			
	11	F	Phylogeny and taxonomy	Chapter 25	MH	
4	14	M	Phylogeny II	Chapter 26, 27	MH	Goldenrod gall lab - week 3 *(meet in computer lab)* *(complete on-line quiz before lab)*
	15	T	Review of phylogeny problem set		MH	
	16	W	Autotrophy: functional morphology - the small	Chapters 28, 29	MH	
	18	F	Autotrophy: functional morphology - the large	Chapters 28, 29	MH	
5	21	M	Symbiotic continuum of autotrophs	e-reserves	MH	Evolution and diversity of plants and fungi *(complete on-line quiz before lab)*
	23	W	Fungi	Chapter 30	MH	
	25	F	Heterotrophy: how to digest food	Chapter 50	EC	
6	28	M	Heterotrophy: excretion, salt/water balance	Chapter 51	EC	Comparative vertebrate morphology *(complete on-line quiz before lab)*
	Mar 2	W	Challenges of life on land: movement	Chapter 47	EC	
	4	F	Challenges of life on land: movement, cont.	Chapter 47	EC	
7	7	M	Guest Lecturer: Sheila Patek			Worms: parasitic vs. free-living lifestyles *(complete on-line quiz before lab)*
	8	T	Review for Exam II		MH/EC	
	9	W	**EXAM II**			
	11	F	no class			
8	12-20		**SPRING BREAK**			
9	21	M	Evolution of nervous systems	e-reserves	EC	Mollusks and arthropods *(complete on-line quiz before lab)*
	22	T	Required pre-lab discussion		JE	
	23	W	Evolution of sensory systems	Chapter 45	EC	
	25	F	Challenges of life on land: circulation and gas exchange	Chapter 48, 49	EC	
10	28	M	Challenges of life on land: temperature regulation	Chapter 40	EC	Vertebrate organ systems – week 1 *(complete on-line quiz before lab)*
	29	T	Required pre-lab discussion		JE	
	30	W	Why sex?	e-reserves	MH	
	Apr 1	F	Pollination biology	e-reserves	MH	
11	4	M	Sexual selection I	Ch. 22.3, e-reserves	EC	Vertebrates organ systems – week 2 *(complete on-line quiz before lab)*
	5	T	Review for Exam III		EC/MH	
	6	W	Guest Lecturer: Patricia Brennan			
	8	F	**EXAM III**			
12	11	M	Sexual dimorphism and sex ratios	e-reserves	EC	**Lab practical exam** *(covers weeks 7-11 labs)*
	13	W	Populations and life histories	Chapter 54	EC	
	15	F	Disease: strategies of pathogens	e-reserves	MH	
13	18	M	Disease: population dynamics	e-reserves	MH	Cemetery demographics and life histories I
	20	W	Disease ecology: when to specialize	e-reserves	MH	
	22	F	Behavioral ecology	Chapter 53	EC	
14	25	M	Behavioral ecology: a case study	e-reserves	EC	Cemetery demographics and life histories II *(meet in computer lab)*
	27	W	Community ecology	Chapter 55	EC	
	29	F	Ecosystem ecology	Chapter 56	EC	
15	May 2	M	Biodiversity and the extinction crisis	Chapter 57.1-.3	EC	Plant-pollinator coevolution
	4	W	Conservation biology	Chapter 57.4	EC	
	6	F	Wrap up; review for the Final Exam		EC/MH	