

BIOLOGY 509 - EVOLUTIONARY BIOLOGY - Fall 2007

Dr. Kevin J. Burns

Office: 231 North Life Sciences; 594-0538

Office Hours: Wednesdays 11:00 - 12:00 p.m. or by appointment

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3.0 Credit Hours Lectures: Monday & Wednesday 9:00 - 10:00 am; LS 269
Discussion: Monday & Wednesday 10:00 - 11:00 am; LS 269

Course Description & Learning Outcomes

Concepts of evolutionary biology including genetics of populations, speciation, systematic biology, adaptation, role of development in evolution, evolution of behavior, and comparative biology.

Emphasis is placed on evolutionary biology as the central organizing principle of biology. During the course, students will develop an appreciation and understanding of how the diversity of life has been shaped by natural selection and other evolutionary processes. Critical thinking skills will be developed through reading and discussing the scientific literature.

Prerequisites

Biology 352 is a prerequisite for this course. Concurrent enrollment is not acceptable. In addition, completion of writing competency requirement is necessary. These prerequisites will be strictly enforced.

Texts

Course Reader: a collection of scientific papers for sale in the bookstore filed under my name (Burns) and course (Evolutionary Biology). These readings will form the basis for the discussions.

Recommended textbook: Futuyma, D. J. 1998. *Evolutionary Biology*. Sinauer Associates (3rd edition). One copy is on reserve in the reserve book room of the library.

Another good textbook on reserve: Freeman and Herron. 2004. *Evolutionary Analysis*. Prentice Hall (3rd edition) (2nd edition, 2001, should also be on reserve)

Grading

Lecture Exam 1	250 points	A = 90% - 100%
Lecture Exam 2	250 points	B = 80% - 90%
Research Paper	250 points	C = 70% - 80%
Group Project	200 points	D = 60% - 70%
Participation	<u>50 points</u>	F = below 60%
Total	1000 points	Note: no + or - grades

Blackboard

Handouts and notes for this class are available on the SDSU blackboard web site. Log-in with the same user name and PIN you use to access the SDSU WebPortal. Be aware that simply downloading the notes from the web site is not a substitute for attending class. Additions and changes will be made during class that may not be available on the web site. Attending lecture is essential to passing this course.

Important Dates:

Project Proposal Due: October 19th

Lecture Exam 1: October 24th

Group Projects: November 7th and 14th

(optional Rough Draft deadline: November 26th)

Research Paper Due: December 5th, 9:00 a.m.

Lecture Exam 2: Mon., December 12th, 8:00 - 10:00 a.m.

Week	Monday	Wednesday	Lecture Readings
27 August	<u>Lecture:</u> Introduction to Course What is evolution and why is it important? Evidence of Evolution	<u>Lecture:</u> History of Evolutionary Biology <u>Discussion:</u> Science and Philosophy	Ch. 1, 2; p.122-123; Appendix II; Paper #1; Ch. 2, 10-13
3 September	LABOR DAY No classes	<u>Lecture:</u> History of Evolutionary Biology <u>Lecture:</u> Selection	Ch. 10 - 13
10 September	<u>Lecture:</u> Mutation, Drift <u>Discussion:</u> Science and Philosophy: Readings: 2, 3, & 4	<u>Lecture:</u> Non-random mating, gene flow <u>Discussion:</u> Science and Philosophy Readings: 2, 3, & 4	Ch. 10 - 13
17 September	<u>Lecture:</u> Population Genetics, con't <u>Discussion:</u> The Adaptationist Program Readings: 5, 6, & 7	<u>Lecture:</u> Systematics <u>Discussion:</u> The Adaptationist Program Readings: 5, 6, & 7	Ch. 5 Paper # 42
24 September	<u>Lecture:</u> Classification <u>Discussion:</u> Population Genetics Readings 8, 9, & 43	<u>Lecture:</u> Speciation (Allopatric, Parapatric, Hybrid Zone) <u>Discussion:</u> Population Genetics Readings 8, 9, & 43	Ch. 15, 16 Paper # 42
1 October	<u>Discussion:</u> Classification Readings: 10, 11, 12, & 13	<u>Lecture:</u> Topic to be Announced	
8 October	<u>Lecture:</u> Speciation (Sympatric) and Species (Introduction) <u>Discussion:</u> Two or three forms of life? Readings: 14 – 19	<u>Lecture:</u> Species <u>Discussion:</u> Two or three forms of life? Readings: 14 – 19	Ch. 15, 16
15 October	<u>Lecture:</u> Species <u>Lecture:</u> Species	<u>Discussion:</u> Species Concepts Readings: 20 – 27 <u>Discussion:</u> Species Concepts Readings: 20 - 27	Ch. 15, 16
22 October	<u>Lecture:</u> Adaptation revisited <u>Lecture:</u> Adaptation, continued	TEST #1	Ch. 12, Ch. 20; p.740 - 748 papers #28 - 34
29 October	<u>Lecture:</u> Comparative Method <u>Discussion:</u> Group Project, readings to be assigned	<u>Lecture:</u> Behavior <u>Discussion:</u> Group Project Readings: to be assigned	papers #28 – 34 Ch. 20 p.740 – 748

5 November	<u>Lecture:</u> Sexual Selection, Sociobiology <u>Discussion:</u> Group Project, readings to be assigned	<u>Lecture:</u> Molecular Evolution <u>Discussion:</u> Group Presentations	Ch. 20 p. 740-748 Ch.22, p.320-327, 325, 395
12 November	Veteran's Day No Classes	<u>Lecture:</u> Molecular Evolution <u>Discussion:</u> Group Presentations	Ch.22, p.320-327, 325, 395
19 November	<u>Lecture:</u> History of Life <u>Discussion:</u> Molecular Evolution Readings: 35, 36, & 37	<u>Lecture:</u> Gradualism and Punctuated Equilibrium <u>Discussion:</u> Molecular Evolution Readings: 35, 36, & 37	Ch. 7, 24, & 25 p.136-138, 495, 512-514 p. 182, 185, 722-723, 706- 715
26 November	<u>Lecture:</u> Extinction <u>Discussion:</u> Adaptation Readings: 28 – 34	<u>Lecture:</u> Evolution and Development <u>Discussion:</u> Adaptation Readings: 28 – 34	Ch. 23
3 December	<u>Lecture:</u> Evolution and Development <u>Discussion:</u> Development and Evolution Readings: 40 & 41 Punctuated Equilibrium Readings: 38 & 39	<u>Lecture:</u> Misconceptions and Common Themes of Evolutionary Biology <u>Discussion:</u> Punctuated Equilibrium Readings: 38 & 39	Ch. 8

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