

BIOLOGY 242: GENOMES AND EVOLUTION

Fall 2017

Instructor: Hugh I. Ellis, Professor of Biology
Shiley Center of Science & Technology (SCST) 478
260-4075; ellis@sandiego.edu

Office Hours: MWF 11:00 am - noon
MF 1:00 - 2:00 pm
by appointment

Text: Urry, L.A. (and others). 2017. Biology, 11th ed. Benjamin Cummings Publishing Company, San Francisco.
Knisely, K. 2017. Writing in Biology, 5th ed. Sinauer/Macmillan, Sunderland, MA.

Course website: <https://ole.sandiego.edu/>

Syllabus

This course is one of a two part sequence in Introductory Biology at the University of San Diego. It is required of Biology, Biochemistry, Behavioral Neuroscience, and some EOSC majors. With its lab, it meets the Core requirement for Scientific and Technological Inquiry. The laboratory, in fact, must be taken concurrently and will include inquiry into the genetic basis of evolutionary change and testing of hypotheses of adaptation.

In this course, you will learn about the mechanisms and results of information flow through organisms and their lineages. Lecture topics will include the nature, expression, and change of hereditary information in DNA, the mechanisms of evolution, and the origins and relationships of major groups of organisms.

Lectures will be every Tuesday and Thursday from 2:30 to 3:50 pm in SCST129. Power Point illustrations to lectures will show up on Blackboard. Please recognize that these are not full lectures, but illustrations of lectures. Nothing quite substitutes for going to lectures. That said, attendance in lecture is not required (except for our Open Classroom date), though it will be difficult to do well in the course without coming to lecture. Any other material you may need will also be posted on Blackboard. So will announcements, including adjustments to the syllabus or discussions about certain topics. But basic communications between members of the class and me will be through e-mail. Blackboard will not be used for posting grades.

Please turn off your cell phones before lecture begins. Computers may only be used in class as an aid in note-taking. No electronic device will be allowed during the exams (cell phones, calculators, etc.). The Academic Integrity policy of the University will be in force at all times.

Learning Outcomes for Biology 242

At the end of the semester a student who has taken both Biology 242 and 242L should be able to:

1. Design and conduct an experimental and/or observational investigation to generate scientific knowledge.
2. Analyze data using methods appropriate to Biology in order to make valid and reliable interpretations.
3. Describe how information flows through cells, organisms, and entire populations; and how it contributes to the evolution of diverse organisms.
4. Identify and use appropriate and sufficient scientific evidence to evaluate claims and explanations about the natural world.

Grading - based on 475 points

◆	There will be two midterm exams*, each @ 100 points	200
◆	One final exam*	150
◆	Pop quizzes on assigned reading and previous lectures	30
◆	On-line reading quizzes administered through the Mastering Biology website	30
◆	Two assignments associated with scientific literature	20
◆	One data analysis project	20
◆	Additional assignments/participation points	25

* All exams, including the midterm, are cumulative.

Letter grades will be determined from a curved distribution. However, scores below 50% will not be considered passing. I will not post keys to exams. If you would like to discuss your exam after you have gotten it back, you are invited to come to my office to discuss it; you may see the key at that time.

Readings

The following schedule outlines the major concepts we expect to cover each week. Specific readings will be assigned from your textbook and announced on Blackboard. You will be expected to have read these *before* lecture. That is also true for assigned readings from the literature and assigned videos. Note that there will be pop quizzes associated with these readings spread throughout the course.

BIOLOGY 242 LECTURE SCHEDULE

Readings from Campbell's Biology, 11th ed.

<u>Date</u>	<u>Concepts</u>	
Sept. 7	Course Overview	
Sept. 12 & 14	Evolution through natural selection explains the diversity and underlying unity of life on Earth Understanding evolution requires understanding information flow at the cellular, organismal and population levels	
Sept. 19 & 21	Protein structure/function and relationship to traits Relationship between the structure and three functions of DNA	
Sept. 26 & 28*	Concepts within the Central Dogma Relationship between genotype and phenotype	
Oct. 3 & 5	DNA replication, mutation, and the generation of new alleles Relationship of (new) alleles to traits	
Oct. 10 & 12	Cell theory (the unit of life is the cell) Regulation of gene expression in prokaryotes	EXAM
Oct. 17 & 19	Evolution of multicellularity Regulation of gene expression in eukaryotes	
Oct. 24 & 26	Developmental gene expression Evolution of diverse animal body plans	
Oct. 31 & Nov. 2	Cost/benefits of asexual/sexual reproduction Variation and adaptations in reproductive life cycles	
Nov. 7 & 9	Populations (the unit of evolution) Gene pool, fitness, and adaptations	EXAM
Nov. 14 & 16	Natural selection and sexual selection	
Nov. 21	Species and speciation (<i>Don't miss class</i>)	
Nov. 23	<i>Happy Thanksgiving!</i>	

