

Genetics
Zoology 3300

FALL SEMESTER 2017

Instructor: Jonathan Clark (<http://www.weber.edu/jonclark/>)
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Office hours: Monday, 1:30–3:00 pm and Thursday, 8:30 – 9:30 am, and by appointment
Text: *Principles of Genetics*, sixth edition, Snustad & Simmons
(older editions may be acceptable but you should correlate chapters and problems with the sixth edition)

COURSE FORMAT

Three lectures (M, W, F, 10:30 AM) and one three-hour laboratory (Thursdays, 12:00 - 3:00 PM) per week. Successful students will spend a considerable amount of time outside of class studying and working on genetics problems from the text.

• All class communication will be done through your mail.weber.edu e-mail account so please check it regularly.

COURSE DESCRIPTION AND OBJECTIVES

This course is a detailed treatment of modern genetics including classical genetics, molecular genetics, and population genetics. Prerequisites include a basic understanding of biology, mathematics, and chemistry. Students will:

- *develop a foundation in genetics and gain an appreciation of the breadth of the subject.*
- *enhance their quantitative thinking and problem-solving skills.*
- *gain experience with experimental genetics and the tools used to study genetics.*
- *learn to collect, analyze, and present experimental data.*

GRADING

Lecture. There will be four exams given approximately during the fourth, seventh, and eleventh weeks of the semester and during finals week. Each exam is weighted equally and is worth 100 points. Exams are given in the *Tracy Hall Science Center Testing Center*. A 40-point assignment on Human Evolution is due by Nov. 30.

Laboratory. Laboratories will include a variety of exercises, including multi-week investigations of classical and molecular genetics. An 80-point lab report is due by Dec. 7. Attendance in laboratory is mandatory and each session will begin with a short quiz covering the lab and related material from class.

There are no make-up exams, make-up quizzes or extra credit

The final grade will be based on a total of 570 points, 440 points for the lecture exams and assignment and 130 points for the laboratories. The following scale is used:

A	93 - 100%	B-	80 - 82%	D+	67 - 69%
A-	90 - 92%	C+	77 - 79%	D	63 - 66%
B+	87 - 89%	C	73 - 76%	D-	60 - 62%
B	83 - 86%	C-	70 - 72%	E	< 60%

Genetics
SEMESTER OUTLINE

DATE	ACTIVITY	NOTES
Aug. 31	Mitosis <i>Understand mitosis with chromosome preparations from living cells</i>	–
Sept. 7	Applications of Probability and Statistics <i>Observe the results of crosses done in maize and test genetic hypotheses using statistics</i>	Lab Quiz 1
Sept. 14	<i>Drosophila</i> Genetics I: Identifying Phenotypic Variation * <i>Perform parental and F1 crosses in the model genetic organism, Drosophila</i>	Lab Quiz 2
Sept. 21	<i>Drosophila</i> Genetics II: Analysis of Phenotypic Variation * <i>Observe the results of the F2 generation and use statistics to test genetic hypotheses</i>	Exam I this week
Sept. 28	Restriction Enzyme Analysis of DNA I: Digestion * <i>Set up restriction endonuclease digestions of bacteriophage lambda DNA</i>	–
Oct. 5	Restriction Enzyme Analysis of DNA II: Electrophoresis * <i>Isolate, digest, and quantitatively analyze plasmid DNA</i>	Lab Quiz 3
Oct. 12	DNA Cloning I: Bacterial Transformation * <i>Introduce plasmid DNA into E. coli and observe the phenotypic results of genetic transformation</i>	Exam II this week
Oct. 19	DNA Cloning II: Plasmid Isolation and Electrophoresis * <i>Isolate, digest, and quantitatively analyze plasmid DNA.</i>	Lab Quiz 4
Oct. 26	Molecular Population Genetics I: Background and Setup * <i>Isolate your own DNA and examine it with the most versatile genetic technique, PCR</i>	Lab Quiz 5
Nov. 2	Molecular Population Genetics II: Analysis and Interpretation * <i>Determine your genotype and compare it to the population represented by your classmates.</i>	–
Nov. 8-10	No Class / No Lab <i>Begin the “Human Evolution” assignment no later than this week</i>	Exam III this week
Nov. 16	Genetic Databases <i>Explore the use of genetic databases to address a variety of medical and biological issues</i>	
Nov. 20-24	No Class / No Lab – Work on assignment and lab report. (see https://dnabarcodes2017.org)	–
Nov. 30	Human Evolution Assignment Due	Due by 12:00 pm
Dec. 7	Laboratory Report Due	Due by 12:00 pm
Dec. 11–14	Exam IV	–

* Identifies the four, multi-week major projects that may be written as a laboratory report

EXPECTATIONS

Students should view and understand the statement of Student-Faculty Expectations on the Department of Zoology’s website: <http://www.weber.edu/zoology/expectations.html>