

BIOLOGY 322 GENETICS LAB

FALL 2012

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Office Hours: Tues & Thurs 10:30-11:30 am or by appointment

Course Web Site: <http://fire.biol.wvu.edu/trent/trent/Biol322index.html>

See Required Reading Assignment entitled *Inspired Choices*

Course content: In this course, we will examine various topics in genetics using four different model organisms: (i) the small, free-living nematode *Caenorhabditis elegans*, (ii) the diminutive mustard *Arabidopsis thaliana*, (iii) the charming jewel wasp *Nasonia vitripennis*, and (iv) the gutsy bacterium *Escherichia coli*. We will use the first three organisms to explore various topics relating to eukaryotic genetics and we will use *Escherichia coli* to explore basic concepts in mutagenesis and prokaryotic gene exchange

Course Objectives:

Content goals: (i.) You should understand and be able to apply classical genetic and molecular genetic principles in a laboratory setting. Specifically, you should obtain a reasonably sophisticated understanding of several major aspects of genetics, including Mendelian genetics, prokaryotic genetics, and molecular genetics. (ii.) You should acquire skills in handling model organisms, keeping detailed research records, analyzing data and writing scientific reports.

Process goals: (i.) You should improve your critical thinking skills through the analysis of experimental data using statistics and probability. (ii.) You should improve your quantitative reasoning skills. (iii.) You should improve your written communication skills.

Lab manual: In lieu of a laboratory manual, each week you will be provided with handouts describing the laboratory exercises or experiments to be performed. *You should have a basic genetics text handy for the duration of the quarter. See links to online texts on the course web site.*

Lab periods: Prior to each lab period, you are required to write, in your own words, an a summary of what we will be doing in that that day. You will submit your summary via a Google.doc form (link below) no later than noon on the day of the lab period.

Your first google submission is due on Tuesday Oct 2 by noon.

<https://docs.google.com/spreadsheet/viewform?fromEmail=true&formkey=dEZpMWI6R2VmaDZQWmlCUU1UMm5sNkE6MA>

Most of the work involved in the assignments will be performed during the scheduled lab periods. Occasionally you may be required to come to the lab at other times to set up crosses and score progeny. At the beginning of each lab period we will have a short discussion over what will be done that day and whether any work outside the scheduled lab period will be necessary.

Lab and lecture attendance is mandatory: unexcused absences are unacceptable.

Assignment Type	Name		Due Date
Homework 1	Mendel Revisited	15	2-Oct
Homework 2	Mendel ChiSquare	15	
Lab Report	Online Databases MLH1	15	
Lab Report	aha genotyping	30	
Lab Data Workup	Mutation rates	15	
Homework 3	Forward Mutagenesis	20	
Lab Data Workup	Nasonia Genotypes	15	
Lab Report	RifR Sequence analysis	35	
In Class Presentat	Forward Mutagenesis	20	
Total Points		180	
Class Participation		25	
Lab Notebookd & Google Forms		100	
Quiz	Quiz 1		
Quiz	Quiz 2		
Exam	Final Quiz		
Total		125	
GRAND TOTAL		430	

Evaluation: See table at right.

The quizzes will be designed to test your understanding of the laboratory exercises.

The number of points you receive for "class participation" will depend on your interest and participation in the laboratory exercises and class discussions. In other words, just showing up for every lab will not guarantee a 25-point score. Allocation of points will be influenced by your punctuality (are you always on time?), engagement (are you focused upon the lab or more interested in socializing?), organization, safe behavior, and consideration of other students.

Lab Note Book and Lab Reports: You should purchase a bound laboratory notebook *with numbered pages*. These are available in the bookstore. This notebook will be used to record your activities and observations during each laboratory period. At the beginning of the notebook, you should have a ***Table of Contents*** which clearly indicates on what pages each exercise is recorded. Because most of the experiments will span two or three laboratory periods, you should organize your notebook by experiment and not by class period. Leave plenty of room in your notebook for data collection and analysis and for notes relating to the progress of your experiments. I encourage you to keep your notebook as if it were a journal of your laboratory activities.

Work up and analyze your data as soon as you've completed the experiment and while it is still fresh in your mind. Your notebook should be neat, well organized and detailed enough such that another person can determine exactly what you did and what your results were for any given experiment. See additional information concerning your lab notebook at this link:

<http://fire.biol.wvu.edu/trent/trent/notebook.pdf>

For some of the lab exercises you will also be required to complete and/or write a formal lab report (which must be word processed). The format of these reports will be discussed in class.

Lab Dress Code: You are absolutely required to wear ***closed-toed shoes*** while working in the laboratory. For labs where we are running gels laced with ethidium bromide you should wear clothing that protects your legs (no short or skirts) and your arms.