BIOL 310 - GENETICS
Syllabus, Fall 2013

Instructor: Dr. Barrie Robison <brobison@uidaho.edu> LSS 266B
Office hours: Wed 11:00 – 12:30

Teaching Assistants: Kayla Hardwick (Tuesday Labs)
Office hrs TBA
Matt Singer (Thursday Labs)
Office hrs TBA

COURSE WEBSITE: The materials for the course can be accessed through the University of Idaho BbLearn System.

COURSE PREREQUISITES: Biol 115: Cells and the Evolution of Life. You should have at least one semester of chemistry. If you do not have these prerequisites, you should see Dr. Robison immediately.

LEARNING OUTCOMES: In accordance with *UI Learning Outcomes*, it is expected that students will:

- **Learn & Integrate:** Students will apply their previous training in biology to solve genetics problems and understand the relationship of genetics to other biological disciplines.
- **Think & Create:** Students will be expected to apply the concepts and approaches learned in this course to solve future academic and professional problems.
- **Communicate:** Students will be expected to effectively communicate genetic concepts and data.
- **Clarify Purpose & Perspective:** It is expected that all students will understand the relationship between genetics and society.
- **Practice Citizenship:** Every student should be able to articulate basic genetic concepts to a lay person, in a manner that demonstrates how fundamental genetics is to our everyday lives.

TEXT: *Genetics: A Conceptual Approach,* Fourth Edition:
The required textbook for this course is Pierce, *Genetics: A Conceptual Approach*, Fourth Edition. There is a very helpful free Web site to accompany the book at www.whfreeman.com/pierce4e. This site from the publisher has activities and animated tutorials for the more challenging concepts from the text. Many of these tutorials are now available in podcast format. If you aspire to a career in biology, this is a textbook you will likely want on your bookshelf for the next 5 years. It will be highly useful for future exams (like the GRE or MCAT), interviews, and other professional opportunities.

LABORATORY MANUAL: The materials for lab will be posted on BbLearn.

OTHER CLASS MATERIALS: *Lab Handouts* and *Lecture Notes* will be posted on the course website. It is your responsibility to print these and have copies for lab as needed. Alternatively, ***you may bring your laptop or tablet to lab*** and use the *pdf* form of the handouts and notes. In many lab exercises, you will be asked to work with genetic data, and having your laptop may be preferable (for some people) to using the supplied departmental computers. *I generally do not post my lecture notes until after class.* If you feel you would benefit from reviewing the material prior to lecture (an excellent strategy in my opinion), you should consider reading the appropriate section of the textbook in advance of each lecture.

GENERAL CONSIDERATIONS: This is a survey course, and as such it will cover a great deal of material. We will examine classical experiments and methods in detail to teach you to interpret data and think like a geneticist. Genetics is one of the central subjects in all of biology, so the approaches we discuss here are used in such diverse disciplines as microbiology, behavior, physiology, ecology, and evolutionary biology.

Problem solving in genetics is based on logic and requires solid mathematical skills. Some of you may find this aspect of the course quite different from other courses you have taken in biology. As with many skills, your performance will improve with practice. This is not a course where you can get a B just by memorizing vocabulary (although you will learn an extensive new vocabulary), and genetics does not lend itself to "cramming." I would suggest that you *start preparing for the first exam now*. Study groups that meet regularly can be an excellent way to master this material.

You are responsible for both the lecture material and the assigned reading. Lectures will be used to stress basic principles, explain complex concepts, and supplement the text. Many lectures will include current topics in genetics that have minimal coverage in current texts, therefore regular attendance is necessary. This is the only way to give you an up-to-date course in a field that moves as quickly as Genetics. Each lecture will be given with the assumption that you have read the assigned material.

Calculators will be required during most exams, but devices that can access the internet are prohibited. All books and notes should remain out of sight, and there will be no talking during exams. No one may leave the room once the exam has begun. We will not answer questions or give hints during an exam except to clarify typographical errors.

Office hours are times set aside for your benefit, so don't wait until you are in big trouble or the day before an exam to use them.

EXAMS: There are 5 exams. The fifth exam is in two parts: the first hour is over the last material covered in the course and the second hour is comprehensive. You may replace your lowest exam grade with the grade from the comprehensive portion of the final. ***Questions or challenges related to the grading of an exam (or other assignment) must be turned in to your TA in writing by 5:00 pm within the following 3 school days after the exam or assignment is returned to you.*** You should include the exam in question and a written explanation of your question or challenge. If an exam is turned in for re-grading, any other grading errors found will also be corrected.

GENETICS LAB: The laboratory portion of this course will consist of a combination of projects, problem sets, and wet labs. ***Lab fees will not be refunded to students who drop the course after the second week of class.***

The laboratory portion of the course has three objectives:

1) To supplement the lecture by presenting opportunities to practice problems similar to those you will encounter on exams.
2) To train students in how to analyze, interpret, and articulate genetic data.
3) To train students in basic genetic techniques, including nucleic acid extraction, PCR amplification, quantification of gene expression, and bioinformatics.

Two major projects will take up the bulk of your time in the laboratory. One of these is CSI Idaho, during which you will learn the basics of forensic genetics. This project will expose you to molecular techniques and analysis from an applied perspective. The second project is an example of basic research in genetics. Specifically, you will study the transcriptional response of a set of genes to

several experimental manipulations. Both of these are group projects, but will involve individual write-ups.

MISSING EXAMS OR LABORATORIES: No make-up exams will be given except with a valid excuse (documented illness, family emergency) or by prior arrangement for University related responsibilities (such as athletic events). Excuses for University related responsibilities must be arranged in writing in advance of any missed lab or exam. Illness or other emergency must be documented in writing (for example, through Student Health) within 3 school days of a missed lab or exam. ***Make up exams are scheduled by appointment with Dr. Robison, and their format will vary substantially from the normal class exam.*** Students may not turn in late lab assignments. Participation in lab is mandatory, and subject to the same rules and restrictions as make-up exams.

ACADEMIC HONESTY: All students are expected to uphold the highest standards of academic honesty. This includes but is not limited to: not cheating, not giving or taking help during exams, not using the ideas of others without giving appropriate credit (including Wikipedia!), and not giving false excuses for missed classes or exams. You may get help from others on the homework *but you may not simply copy* from someone else. ***To facilitate enforcement of University policies, we will ask that electronic versions of major writing assignments be submitted along with printed versions.*** Any incident of academic dishonesty will be handled according to the guidelines of the University of Idaho.

GRADING POLICY: Your grade will be based on a total of 1000 possible points. Six 50-minute exams are worth 100 points each, and the lowest of these will be dropped. Your laboratory performance will make up a significant portion of your grade, as indicated below. Your final grade will be the grade you earn - no deals, no plea bargains. The grading scale is standard: A (90 -100 %), B (89 - 80 %), C (79 - 70 %), D (69-60 %), F(below 60 %).

GRADING BREAKDOWN:

Assignment	Points
Exams *(Best 5 of 6)*	**500**
Lab – *Genetics and Society*	**25**
Lab – *Principles of Probability*	**50**
Lab – *The Chi Square Test*	**25**
Lab – *Linkage and Mapping*	**50**
Lab – *Forensic Genetics Write-up*	**100**
Lab – *Data Analysis and Articulation*	**50**
Lab – *Gene Expression Write-up*	**100**
Lab – *Quantitative Genetics*	**50**
Lab – *Population and Evolutionary Genetics*	**50**
Total	**1000**