

General Genetics (BioSc231) Syllabus

Instructor
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Office Hours - MWF 9:00 - 9:50, or by appointment.

Course Description: This course will cover the principles of heredity and reasons for variation in all living organisms. After completing this course you should be familiar with several phenomena, principles, rules and laws of genetics including: Mendel's Law of segregation and independent assortment; meiosis and mitosis; origins of specific phenotypic and genotypic ratios; mechanisms of sex determination; sex linkage; gene mapping; complementation; DNA structure and function; cytoplasmic inheritance; chromosomal aberrations; mutations.

Class Meeting: MWF 10:00 to 11:00 231 UCE

Textbook: An Introduction to Genetic Analysis by Griffiths et al (Eighth edition)

You will be expected to have read the assigned chapter and related questions before the corresponding class period. The end of chapter "Review the Basics" questions and assigned questions will serve as the basis for classroom discussion. Make sure that you are familiar with all key terms at the end of each assigned chapter.

Reserve material: Old exams and links to websites relevant to General Genetics can be accessed through the course HomePage: http://www.umr.edu/-microbio/Bio231.html

If you have any comments or concerns regarding this course or the instructor (good or bad) please feel free to discuss them with me. If you are not satisfied with my response or prefer to speak with someone else, you may contact the Chair of the Biology Department, Dr. Robert Aronstam (aronstam@umr.edu, 341-4831) or the Dean of the College of Arts and Sciences, Dr. Paula Lutz (plutz@umr.edu, 341-4131)
Course Objectives: After completion of this course you should be able to:

• Use the principles of Mendelian genetics to predict the progeny of crosses of known genotypes.
• Deduce parental genotypes based upon progeny ratios.
• Use a pedigree and the laws of inheritance to calculate the risk of affected children in a specific mating.
• Predict the outcomes of crosses involving sex-linked genes.
• Diagram and explain the processes of mitosis and meiosis.
• Deduce gene order and map distances on a chromosome.
• Explain the processes of replication, transcription and translation.
• Draw a diagram illustrating a short stretch of DNA, RNA or protein and label the significant features of each.

Grading and Exams: Your grade will be based on your scores on five exams (four midterm exams and one final) (60 points each), 10 quizzes and homework assignments (10 points each), a written report on an inherited genetic disorder (60 points) and participation (40 points) for a total of 500 points. Participation includes asking and answering questions, bringing to class relevant information from your own research, etc. Your participation grade will depend on attendance - if you have more than four unexcused absences you will forfeit the 40 points. There will be no make-up exams during the term; however, during the second half of the scheduled final you may have the opportunity to take a comprehensive make-up exam.

The exam dates are scheduled as follows:

Exam 1       Monday 9/12
Exam 2       Monday 10/3
Exam 3       Wednesday 10/26
Exam 4       Wednesday 11/16
Exam 5       Wednesday, December 14, 4:00 - 6:00

All exams will take place in the regular lecture room (213 UCE) unless notified otherwise. Depending on interest, I will be offering review sessions before each exam and the time and date will be arranged during class. This is intended to be an opportunity for you to ask questions and request clarification of specific topics - so come prepared.
**Written Reports** Before the first exam (9/12) each student will select an inherited human genetic disorder upon which they will prepare a 3 to 4 page written report. The final report will be due Friday Dec. 2. The paper will describe the characteristics, the mode of inheritance and physiological explanation of the disorder (if known). Prior to exams 2, 3 and 4, specific tasks related to your chosen genetic disorder will be required. Prior to exam 2 you will turn in a sample pedigree illustrating the inheritance of the genetic disorder. Prior to exam 3 you will turn in a description of the location of the gene(s) associated with the disorder on the human genetic map. Prior to exam 4 you will turn in an outline of your report. The total project will be worth 60 points. 10 points for each pre-assignment and 30 points for the final report. I have a list of inherited human genetic disorders that you may choose or you are welcome to select one of your own.

**Lecture Topics**

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