

# Biology 150 – Human Genetics

Spring 2013, 3 Credits, CRN # 20079

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**Office Hours:** Mon 12-1 PM, Tues 3:30-4:30 PM, Wed 12-1 PM, Thurs 4:30-5:30 PM

## Class Schedule:

Lecture            Room    516            1:30 PM – 2:55 PM            Tuesday/Thursday

## Required Materials:

Textbook:            Human Genetics: Concepts and Applications, 10<sup>th</sup> edition. Lewis.

## Course Description:

A one semester course examining genetics from a human perspective. Discussion of patterns of inheritance, human genetic diseases and disorders, and the application of genetic technologies in other organisms for human use.

## Course Objectives

The student will:

1. Explain the function of cells and cell organelles.
2. Understand the patterns of Mendelian inheritance and analyze pedigrees.
3. Explain and give examples of exceptions to standard Mendelian inheritance.
4. Describe how genes are involved in sex determination.
5. Give examples of genetic traits caused by multiple genes, and explain how they are inherited.
6. Describe the structure of DNA and explain how DNA replication occurs.
7. Understand and describe the processes of transcription and translation.
8. Explain what causes DNA to mutate, and how gene mutations cause disease.
9. Describe chromosome structure, explain how chromosomal abnormalities occur, and give examples of diseases caused by chromosomal abnormalities.
10. Explain population genetics, and explain how the genetics of a population can be changed.
11. Understand the genetic basis of cancer.
12. Explain the current genetic technologies used in labs and in agriculture.
13. Describe the different ways to do genetic testing, and understand the field of genetic counseling.
14. Understand the field of genomics, including the human genome project.

## Class Policies:

1. Class attendance and tardy policy follows the regulations in the IVC catalog.
2. Attendance will be taken at the start of each lecture.
3. Students may be asked to drop the class if absent or tardy from more than 3 lectures. **NOTE:** Family issues, travel issues, work-related problems, alarm clock failure, UFO sightings, etc., are not valid reasons for being late or absent to class! Only real emergencies will be considered to be excused absences.
4. The deadline for dropping a course without appearing on transcript is **Sunday, January 27**.
5. The deadline for dropping a full-term class is **Saturday, April 13**.
6. No food or drinks in the classroom, except for bottled water.
7. Cell phones must be turned off at all times. Ringing cell phones are a distraction both to me and to other students in the class. If you must use your cell phone during class, please take it outside, and then come back in when you are done. You should not be checking your phone, or texting, during lectures. If you are caught checking your phone, or texting, during class, you may be asked to leave for the day and will be marked absent.

8. No talking during class. Talking is a distraction to me and other students in the class. If you have questions during the lecture, please ask me! If you are caught talking, you may be asked to leave for the day and will be marked absent.
9. Cheating and plagiarism will not be tolerated at all! **Plagiarism is defined as copying entire sections or parts from the textbook or any other source (including other students) for homework assignments.** Students will receive a **zero** for any homework if they are caught plagiarizing. Anyone caught cheating during exams will be given a **zero** for that exam. Students may work together for homework, but each student must turn in their own work in their own words. **If students turn in homework with the same or similar wording (i.e., from copying off another student), they will both be given a zero for that homework assignment.** Additional disciplinary action may be taken if needed.
10. Any student with a documented disability who may need educational accommodations should notify the instructor or Disabled Student Programs and Services Office (DSP&S; Room 2117, Health Science Building; 355-6312) as soon as possible.

**Grading Policies:**

1. There will be **4** exams, worth **100 points** each (**400 points** total). Exams will begin at the start of class. Exams will consist of multiple choice/matching/true-false questions, and short answer questions. If you are late to the exam, you will not be given extra time to finish it. There will be no make-up exams, except for extreme circumstances. If you have a valid, documented reason for missing an exam, it is **your responsibility** to tell me about it and provide valid documentation by the **next class meeting**, otherwise you will not have the opportunity to make up the exam, and will be given a **zero** for that exam.
2. There will be **10** homework assignments worth **20 points** each (**200 points** total). Homework assignments are due at the **start** of the class. Homework cannot be made up, except for extreme circumstances. **I do not** accept late assignments! If you are late to class (once the lecture begins), you will not get credit for your homework assignment!
3. There will be **3** practice problem sets that are worth **5** extra credit points each (**15** total). These involve questions from chapters not covered on the homework assignments. Practice problems are due at the **start** of the class. Practice problems cannot be made up. **I do not** accept late assignments! If you are late to class (once the lecture begins), you will not get credit for your practice problems! There will also be extra credit available during the review sessions and on the exams.
4. Spelling and grammar count on all written assignments! You will lose up to **20% of the points** on each assignment if you have excessive spelling or grammatical errors.

**Grading scale:**

4 exams	=	400 points
10 Homework assignments	=	200 points
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<b>Total</b>	<b>=</b>	<b>600 points</b>

<b>A</b>	540 – 600 points
<b>B</b>	480 – 539 points
<b>C</b>	420 – 479 points
<b>D</b>	360 – 419 points
<b>F</b>	0 – 359 points

**Student Learning Outcomes (SLOs): (1) Communication Skills, (2) Critical Thinking Skills, (3) Personal Responsibility, (4) Information Literacy, (5) Global Awareness**

Upon completion of this course students will be able to:

1. Answer exam questions that deal with population genetics. (5)
2. Show personal responsibility by turning in homework assignments on time. (3)
3. Answer exam questions that deal with critical thinking problem solving. (2)

**How to do well in this class:**

1. Make sure you come on time to all lectures! Arriving late or missing a class for any reason (excused or unexcused) can cause you to miss lecture material, and will only put you at a disadvantage in this class, and you will **NOT** be able to turn in homework if you come late that day!
2. Make sure you know what will be happening each day for class! Keep the class schedule handy.
3. Skim through or read the chapter before coming to lecture. You will have a general feel for the subject matter, which will help your understanding of the material during lecture. Look through the figures for the chapter, and try to understand them.
4. Pay attention during lectures! I will say things during lecture that are not written on the PowerPoint slides or the board that will be on the exams. Make sure you take good notes during class. Don't just write down word-for-word what is on the slides. Listen to what I have to say, and take notes on that also!
5. Study, study, study! You should spend at least 4-5 hours studying for this class each week. You should study in an area where there are no distractions. However, you should also spend time studying in groups. Nothing makes you learn the material better than having to explain it to someone else!
6. Spend quality time doing the homework assignments! They are a significant part of your grade, and will help you to prepare for questions found on the exams.
7. Don't cram! It's better to spend some time each week studying as compared to saving it all until the night before the exam.
8. Remember the previous lectures! Even though none of the exams are comprehensive, remembering material from previous lectures will help you immensely for later exams.
9. When answering homework/exam questions do not overcomplicate the question! Students tend to think that questions are more difficult than they really are. Just answer the question being asked! However, make sure that you read the questions very carefully to make sure that you are starting the problem correctly!

**Tentative Class Schedule (Tues/Thurs 1:30 PM – 2:55 PM)**

<b>Week</b>	<b>Tuesday</b>	<b>Thursday</b>
Jan 15/17	Introduction to the class	Chapter 1 – Overview of Genetics
Jan 22/24	Chapter 2 – Cells	Chapter 2 – Cells / Chapter 3 – Meiosis and Development / <b>HW 1 due</b>
Jan 29/31	Chapter 3 – Meiosis and Development	Chapter 9 – DNA Structure and Replication / <b>HW 2 due</b>
Feb 5/7	Chapter 10 – Gene Action: From DNA to Protein	<u>Review for Exam 1</u> / <b>HW 3 due</b>
Feb 12/14	<b>Exam 1 (Ch. 1-3, 9, 10)</b>	Chapter 4 – Single-Gene Inheritance
Feb 19/21	Chapter 4 – Single-Gene Inheritance	Chapter 5 – Beyond Mendel's Laws
Feb 26/28	Chapter 12 – Gene Mutation / <b>HW 4 due</b>	Chapter 6 – Matters of Sex / <b>HW 5 due</b>
Mar 5/7	Chapter 13 – Chromosomes	<u>Review for Exam 2</u> / <b>HW 6 due</b>
Mar 12/14	<b>Exam 2 (Ch. 4-6, 12, 13)</b>	Chapter 7 – Multifactorial Traits
Mar 19/21	Chapter 8 – Genetics of Behavior	Chapter 14 – Constant Allele Frequencies / <b>HW 7 due</b>
Mar 26/28	Chapter 15 – Changing Allele Frequencies	Chapter 18 – Genetics of Cancer / <b>HW 8 due</b>
Apr 2/4	<b>SPRING BREAK</b>	<b>SPRING BREAK</b>
Apr 9/11	<u>Review for Exam 3</u> / <b>Practice problems 1 due</b>	<b>Exam 3 (Ch. 7, 8, 14, 15, 18)</b>
Apr 16/18	Chapter 19 – Genetic Technologies	Chapter 19 – Genetic Technologies
Apr 23/25	Chapter 21 – Reproductive Technologies	Chapter 20 – Genetic Testing and Treatment / <b>HW 9 due</b>
Apr 30 / May 2	Chapter 20 – Genetic Testing and Treatment / <b>Practice problems 2 due</b>	Chapter 22 – Genomics / <b>HW 10 due</b>
May 7/9	<u>Review for Exam 4</u> / <b>Practice problems 3 due</b>	<b>Exam 4 (Ch. 19-22)</b>