

HUMAN GENETICS

Biol 312 – Spring 2019

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Office Hours:
Wed & Fri 10-11 am
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Required for Lecture: 1) Human Genetics: Concepts and Applications (11th ed) by Lewis. Bookstore Rental.

Required for Lab: Biol 312 Lab Manual. For purchase from Bookstore

Meetings	Meeting Times
Lecture	Mon, Wed, Fri 1:00-1:50 pm; CBB 165
Lab Sect 1	Mon, 9:00 - 11:50 am; CBB 336

Course Objectives:

- 1) study human genes, their functions, mode of inheritance and mutations causing disorders,
- 2) gain knowledge in the clinical manifestations, treatment and gene therapy of human genetic disorders,
- 3) make informed health decisions and bioethical decisions in your future,
- 4) perform human pedigree analyses and molecular genetic testing.

Course Prerequisite: Biol 210 (Genetics). I will expect that you have good background knowledge of the basic principles of classical and molecular genetics. It will be your responsibility to review appropriate materials if necessary. Your textbook has some outstanding chapters (that we will not have time to cover in lecture) to help you to review major genetic concepts.

Lecture Exams	50%	Lab Reports	35%	Participation	15%
1	12.5	Sibling Comparison	5	Oral (PPT) Presentation Discussions	10 5
2	12.5	Human Pedigree	5		
3	12.5	COMT & Warfarin Genotypes	5		
4	12.5	Human Karyotyping	5		
		CSI Investigation	5		
		Bioinformatics	5		
		7 Genotypes of your Choice	5		

Your final letter grade is calculated as follows: The grading scale is firm.

A = 92.5-100	B = 82.5-86.4	C = 72.5-76.4	D = 59.5-66.4
A- = 89.5-92.4	B- = 79.5-82.4	C- = 69.5-72.4	F = < 59.5
B+ = 86.5-89.4	C+ = 76.5-79.4	D+ = 66.5-69.4	

Attendance Policy: Students who must miss an exam due to religious observances or participation in university sanctioned events should notify me within the first 3 weeks of the beginning of class, so makeup arrangements can be made. Other valid excuses for missing an exam or lab are death in the family, serious illness, or accident. In such cases: (1) you must provide evidence of some kind (e.g. note from doctor), **and** (2) you must reschedule **within 24 hrs** after the date of the deadline. Without a legitimate excuse, no make-up will be allowed.

Academic Misconduct: You are responsible for the honest completion and representation of your work and for the respect of others' academic endeavors. Any act of cheating, plagiarism, or academic misconduct is subject to the penalties outlined in UWS Chapter 14. Please refer to this link for more information:

<http://www.uwsp.edu/comm/wdeering/plag.pdf>

Suggested Study Habits:

It is often observed that people learn more when they encounter and interact with subject material in different ways.

The following scale presents representative measures of how we might learn through different forms of interaction.

You learn:

10% of what we **read**
20% of what we **hear**
30% of what we **see**
40% of what we **see & hear**
50% of what we **write**
60% of what is **discussed**
70% of what we **experience**, and
95% of what we **teach**

Before each class:

- a) Read the textbook chapters and summary sections that pertain to the info in the lecture slides (PowerPoint). While reading, take notes on the side of each slide to help clarify the information discussed in class. These notes can be used as lecture slide guide sheets.

Before the exam:

- a) **Rewrite your notes!** For each lecture, continue developing your lecture slide guide sheets and write out the information that was covered for each slide. Try to describe any images/figures on the slide in your own words. Try to do this for each lecture BEFORE the next lecture. Then read it over once to see the whole picture or overall theme of that lecture. When appropriate, make a table of info to help compare concepts.
- b) **Anticipate exam questions.** Come up with 1-2 questions of your own from each slide to quiz yourself later. Definitions, short answers, problems, and comparisons are all good types of questions.
- c) **Study your notes.** At the end of each week you will have made lecture slide guide sheets that include your notes for that material. Before the week's lectures, read over your lecture slide guide sheets and highlight only the information you could not remember.
- d) **Focus your studies.** Before the exam you will have made a set of lecture slide guide sheets with the information you need to reinforce already highlighted. Focus on this highlighted material one or two days before the exam. Reread, highlight info that you are having trouble learning or remembering and say it out loud, to yourself, with another person from class, a friend or study group.
- e) **Practice questions.** At the end of each chapter, try the practice questions (suggested on D2L) before looking at the answers in the back of the book. Write down the ones you do not understand and ask the instructor for guidance with those problems.
- f) **Revisit your study questions.** Try to answer the questions that you generated for each slide. Study with someone in class and try to answer each other's questions.
- g) **Teach your peers.** If you can teach it to another person, then you know it!

The night before the exam:

- a) **Value your sleep.** Being wakeful and well rested can help your performance on the exam. Be sure to get a good night's sleep before the exam. Cramming at the expense of sleep is not the best method.
- b) **Try to relax.** Study hard, but also seek ways to reduce your stress. Take breaks to help refocus your mind.

After the exam:

- a) A good grade can result from **reading** the text and your notes, **listening** to lectures, **seeing** the words and figures, **writing** and **rewriting** notes from class, the **experience** of answering questions from the chapters or provided, and **discussing** topics with another person (saying it out loud).
- b) Your grade should reflect the amount of cumulative effort you put into your studying. Remember, for every hour of lecture, you should have a lot two hours of designated studying time. In other words, for each exam you should be spending about 10-15 hrs studying! It isn't possible to effectively achieve that right before an exam.

If you can teach it to another person, then you know it! **“The best way to learn is to teach!”**

HUMAN GENETICS SCHEDULE

Spring 2019

Week	Date	Topic	Ch: Slides (Lab Pages)
1	Jan 23 25	Syllabus / Overview of Human Genetics Overview of Human Genetics	1 1
2	28-lab	Choose Genetic Disorder for Future PPT Presentation Isolate your DNA	(3-11) (12-13)
	28	Cells	2
	30 Feb 1	Cells Development	2 3
3	4-lab	Preparing for Pedigree; (Family phenotypes due Feb 18) Genetic Traits Lab (Charts due Feb 11)	(14-15) (17-19)
	4	Development	3
	6 8	Single Gene Inheritance Single Gene Inheritance	4 4
4	11-lab	(Genetic Traits Chart Due) Directions to Pedigree Analysis; Sibling Comparisons Lab (Report due at end of lab)	(24-25) (16-23)
	11	Exceptions to Mendel's Laws	5
	13 15	Exceptions to Mendel's Laws Sex-Linked Traits	5 6
5	18-lab	(Family Phenotypes Due) Human Pedigree Lab	(24-31)
	18	Sex-Linked Traits	6
	20 22	EXAM I Multifactorial Traits	Ch 1-5 7
6	25-lab	(Pedigree Report due) Warfarin & ComT Lab – PCR 2 Oral Presentations	(32-39)
	25	Multifactorial Traits	7
	27 Mar 1	Genetics of Behavior Genetics of Behavior	8 8
7	4-lab	Warfarin & ComT Lab – Gel Electrophoresis 2 Oral Presentations	(40-45)
	4	Control of Gene Expression	11
	6 8	Control of Gene Expression Gene Mutation	11 12
8	11-trip	(Warfarin & ComT Report due) Prevention Genetics Human Genotyping Company All-day Workshop in Marshfield	(PG packet)
	11	(workshop)	(PG packet)
	12 13	Gene Mutation Chromosomes	12 13

Week	Date	Topic	Ch: Slides (Lab Pages)
	18-22	SPRING BREAK	
9	25-lab	Human Karyotyping Lab	(48-51)
	25	Chromosomes	13
	27 29	EXAM II Chromosomes	Ch 6-8,11,12 13
10	April 1-lab	(Human Karyotype Report Due) CSI Lab – PCR Discussion: Criminal Justice System & Law Enforcement 2 Oral Presentations	(52-59) (68-71)
	1	Population Genetics	14
	3 5	Population Genetics Changing Allele Frequencies	14 15
11	8-lab	CSI Lab – Gel Electrophoresis Discussion: DNA, Crime, & Law Enforcement 2 Oral Presentations	(60-67)
	8	Changing Allele Frequencies	15
	10 12	Human Ancestry Human Ancestry	16 16
12	15-lab	(CSI Report Due) Bioinformatics Lab – Isolate Cheek DNA & PCR Activities: Genetic Variation in Pops, Genes Trace Human History 2 Oral Presentations	(72-81) (96-105)
	15	Genetics of Immunity	17
	17 19	Genetics of Immunity Genetics of Cancer	17 18
13	22-lab	Bioinformatics Lab – Gel Electrophoresis Discussions: Direct-To-Consumer Genetic Testing	(82-86)
	22	Genetics of Cancer	18
	24 26	EXAM III Family History: Breast Cancer	Ch 13-17 18
14	29-lab	Bioinformatics Lab – Population Statistics Other Alleles in Your Genome – 7 PCRs 2 Oral Presentations	(86-95) (106-113)
	29	Genetic Technologies	19
	May 1 3	Genetic Technologies & CRISPR Genetic Testing & Treatment	19 + 20
15	6-lab	(Bioinformatics Report Due) Other Alleles – Gel Electrophoresis 2 Oral Presentations	(114-117)
	6	Genetic Testing & Treatment	20
	8 10	Reproductive Technologies Reproductive Technologies (Other Alleles Report Due)	21 21
Final	Mon 13	EXAM IV (10:15 – 12:15); CBB 126	Ch: 18-21