

BIOLOGY 210 - PRINCIPLES OF GENETICS

Section 02, Fall 2017 Course Syllabus

Instructor:

Dr. Thomas Lentz

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Course Information:

Lecture – Room 120, Trainer Natural Resources Building (TNR)
Monday, Tuesday, Thursday; 2:00pm – 2:50pm

Course website – see D2L

Office hours: Monday, Tuesday, Thursday 3-4:00pm; and by
appointment

Required Text:

Brooker, R.J. 2015. *Genetics: Analysis & Principles*, 5th ed. Can be rented in the university bookstore.

Course Objective:

The objective of this course is to understand the general principles of genetics that contribute to heredity and variation among organisms. Particular focus will be placed on the molecular basis of transmission, cytological, molecular and population genetics.

Learning Outcomes:

University Level: Investigation / Understanding the Physical World:

- 1) Infer relationships, make predictions and solving problems based on an analysis of evidence or scientific information.
- 2) Apply scientific concepts, quantitative techniques and methods to solving problems and making decisions.
- 3) Describe the relevance of some aspect of the natural science to their lives and society.

Biochemistry/Biology Program Level:

- 1) Apply the scientific method, using appropriate theoretical and practical skills to design research studies, answer biological questions and/or solve problems.
- 2) Describe the flow of genetic information, the chromosome theory of heredity, and the relationship between genetics and evolutionary theory.
- 3) Evaluate and discuss contemporary social and ethical issues related to biology.

Genetics Course Level:

- 1) Compare the basic principles of inheritance at the molecular, cellular and organismal levels, beyond the scope of an introductory course.
- 2) Compare relationships between molecule/cell level phenomena (modern/molecular genetics) and organism-level patterns of heredity (classical/transmission genetics).
- 3) Apply this knowledge in a variety of problem-solving situations.
- 4) Integrate knowledge of DNA with the concepts of cellular function, evolution and biotechnology.
- 5) Appraise ethical issues involved with the study of genetics, biotechnology and medicine.

Grading:

Grade Items	% of Course Grade
Exam I	12 %
Exam II	12 %
Exam III	12 %
Exam IV	12 %
Exam V	12 %
Comprehensive Final	20 %
Research Project 1	10 %
Research Project 2	10 %
Total	100 %

Grade Scale:

A ≥ 93%	B+ ≥ 87%	C+ ≥ 77%	D+ ≥ 67%	F ≤ 59%
	B ≥ 83%	C ≥ 73%	D ≥ 63%	
A- ≥ 90%	B- ≥ 80%	C- ≥ 70%	D- ≥ 60%	

Grades will be posted on D2L

Exams and Assignments:

There will be 5 Exams given during class lecture time, and 1 comprehensive Final. Each exam will cover about 5 lectures, excluding the immediately prior lecture. The lecture immediately prior to an exam will be covered on the following exam. All exams must be taken for a grade. The lowest exam grade will be dropped from your average. Each exam is worth 15% of the course grade. The final is worth 20% of the course grade.

There will be 2 research projects over the course of the semester. Each project is worth 10% of the course grade. Description and grading rubrics for these projects can be found on the course D2L webpage.

Suggested problems from your textbook will be posted each week on D2L. Answers are in the back of the textbook for you to refer to. Although these problems will not be graded, **some may be used as questions on the exams**. In addition, you have the option to discuss the genetics problems during lecture, with the instructor during office hours or by appointment, and/or attend weekly tutoring sessions. Tutoring sessions are a great way to review as well as get help!

Attendance Policy:

- Attendance at all lectures and labs is required. Any missed assignments cannot be made up without approved documentation for an excusable of absence.
- Excusable absences include illness, accident, family emergency, professional development activity, religious activity (see UWSP University Handbook Chapter 22), or university sanctioned event. Acceptable documentation is the instructor's discretion, but may be written or electronic documentation for the reason of absence. In the case you have an expected or unexpected absence, please contact the instructor **AS SOON AS POSSIBLE** to notify about the nature of the absence and determine if it can be excused.
- Late arrival to class will not be excused and any assignment, quiz, or exam due during that class will not be granted a time extension.

Academic Conduct:

Do not copy the work of other students; Do not represent the work of other students as your own; Do not share your work with other students

You are responsible for the honest completion and representation of your work and for the respect of others' academic endeavors. Any action of cheating, plagiarism, or academic misconduct is subject to the penalties outlined in UWS University Community Rights and Responsibilities, Chapter 14. Please refer to the University Community Rights and Responsibilities rules and regulations for more information: <https://www.uwsp.edu/dos/Documents/CommunityRights.pdf#page=11>

Student assignments determined to be in violation of these policies will result in a grade of zero (0). Depending on the circumstance, students may receive further penalty in accordance with these policies.

Course Communication:

Information about this course will be communicated through D2L and/or sent to University email accounts. Students are responsible for/expected to check their University email regularly. If you use an email account other than your University account to contact the instructor, be sure your full name is included in the message!

Electronic Devices:

Cell phones should be turned **OFF** and **NOT BE USED** during class times. No other communication or musical devices are allowed. Students needing an electronic language dictionary during exams may use one with permission from the instructor (see below). No video or audio recording of lectures is permitted without the prior permission from the instructor (see below).

Students Seeking Assistance & Students Disabilities:

As the instructor, it is my goal to meet the educational needs of ALL STUDENTS and to provide the best learning environment possible.

Any students seeking/considering use of assistive technology, materials, or accommodations are encouraged to talk with the instructor at the beginning of the course. It is my goal to find the most effective way to teach all students. Students with a disability seeking accommodations should also register with the Disability and Assistive Technology Center (<https://www.uwsp.edu/disability/Pages/default.aspx>) in the Learning Resource Center (the Library).

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.

BIOL 210 COURSE SCHEDULE – Principles of Genetics, Fall 2017

Week	Date	Topic	Chapter (Slides)
1	5	Syllabus / Overview of Genetics	1
	7	DNA as Genetic Material	9
2	11	Molecular Structure of DNA and RNA	9
	12	Chromosome Organization and Structure	10
	14	DNA Replication	11
3	18	DNA Replication	11
	19	Gene Transcription in Prokaryotes	12
	21	EXAM I	(Chapters 1, 9, 10, 11)
4	25	Gene Transcription in Eukaryotes & RNA Modification	12
	26	Genetic Code	13
	28	Translation	13
5	2	Gene Regulation in Prokaryotes	14
	3	Gene Regulation in Eukaryotes at DNA Level	15
	5	Gene Regulation in Eukaryotes at RNA Level	16
6	9	Gene Mutation	18
	10	EXAM II	(Chapters 12, 13, 14, 15, 16)
	12	Gene Mutation	18
7	16	DNA Repair	18
	17	Transposable Elements & Viruses	17/19
	19	Mendelian Inheritance	2
8	23	Mendelian Inheritance	2
	24	Cell Division: Mitosis	3
	26	Cell Division: Meiosis	3
9	30	EXAM III	(Chapters 18, 17, 19, 2, 3 mitosis)
	31	Inheritance Patterns: Forms of Allele Expression	4
	2	Inheritance Patterns: Factors Affecting Inheritance	4
10	6	Variation in Chromosome Structure and Number	8
	7	Non-Mendelian Inheritance	5
	9	Genetic Linkage and Mapping, Research Project 1 Due	6
11	13	Population Genetics	26
	14	Population Genetics	26
	16	Genetic Transfer in Bacteria and Bacteriophage	7
12	20	EXAM IV	(Chapters 3 meiosis, 4, 5, 6, 8, 26)
	21	DNA Technologies	20
	23 & 24	Thanksgiving Break!!!	
13	27	DNA Technologies	20
	28	DNA Technologies/Metagenomics	20/22
	30	Biotechnology	21
14	4	Biotechnology	21
	5	Biotechnology/Funct. Genomics, Research Project 2 Due	21/23
	7	EXAM V	(Chapters 7, 20, 21, 22, 23)
15	11	Medical Genetics & Cancer	24
	12	Medical Genetics & Cancer	24
	14	Extra-Lecture Day (Exam Review Day)	

COMPREHENSIVE FINAL : Wednesday, December 20 (12/20) 2:45pm – 4:45pm

