

Biology 315 - Genetics
Term 1, 2019

<u>Day</u>		<u>Lecture Topic</u>	<u>Reading</u>
M Aug	26	The Science of Genetics Mitosis & Meiosis	Ch. 1 Ch. 12 pp326-339
T	27	Mitosis & Meiosis Problems- Ch.12: 3-5,8-10,13,15,19, & 21 Mendelian Genetics	Ch. 12 pp326-339 Ch. 11
W	28	Principles of Segregation & Probability Problems- Ch. 11: 1,3-8,10,11,17,25 & 27 Independent Assortment	Ch. 11 Ch. 11
Th	29	Independent Assortment Problems- Ch.11: 2,9,15,18,19,21,23,28 & 31 Sex Linkage and Sex Determination Problems- Ch. 12: 23-27,30,32-34,46 & 47 Extensions of Mendelian Genetics	Ch. 11 Ch. 12 Ch. 13
F	30	Extensions of Mendelian Genetics Problems- Ch. 13: 3,5-9,13, 30,31,34,36,37, & 38 Research Proposal Due – 9:00 AM Paper Critique Topic Must Be Approved	Ch. 13
M Sep (AM)	2	Linkage, Recombination, & Mapping Problems- Ch. 14: 1,3,4,6,9,10,11,16,17,18,22,23,25 & 27	Ch. 14
M (PM)		Tetrad Analysis – Unordered Tetrads	
T	3	Ordered Tetrads Chromosomal Mutation Critique Due – 9:00 AM	Ch. 16
W	4	Chromosomal Mutation Problems- Ch. 16: 1,2,4,5,6,11,15,16,18,25,-28,30,34,35,36,38 & 39	Ch. 16
Th	5	Is DNA the Genetic Material DNA Structure & Organization Problems- Ch. 2: 1,2,4,5,13,15-20,23,24,27,32 & 38	Ch. 2
F	6	EXAM 1	
M (AM)	9	DNA Replication & Recombination	Ch. 3
M (PM)		Replication & Recombination Problems- Ch. 3: 1-4,14-18 & 35	Ch. 3
T	10	Transcription Guest Speaker- Jason Napoli-How to find a job after college-2:00-3:00 pm	Ch. 5

W	11	Transcription Problems- Ch. 5: 1-4,7,9,11,14,21 & 23 Protein Structure & Translation Last Day to Submit a Paper Draft	Ch. 5 Ch. 6
Th	12	Translation Problems- Ch. 6: 2,5,6,7,11,12,13,17,18,22,23,24,31,33 & 34 Cell Cycle	Ch. 6 Ch. 20 pp578-581 pp 588-593
F	13	Cell Cycle Epigenetics	Ch. 18 pp529-534
M	(AM) 16	Epigenetics Lab Research Paper Due - 9:00 AM	
M	(PM)	DNA Mutations Problems- Ch. 7: 4,9,10,13,17 & 29	Ch. 7
T	17	Oral Lab Reports	
W	18	EXAM 2	

About the Course:

What is the most fundamental life science? Different biologists will certainly give different answers, but many scientists would claim that it is genetics. Consider that the things we study in biology, including most of the physical characteristics, behavior, and the ways organisms live, are inherited. Therefore, in order to understand an organism fully, it is essential to understand its heredity. Genetics is the study of heredity. We will explore and analyze two of the three main branches of contemporary genetics: (1) transmission genetics, the study of the pattern of transmission of traits from one generation to the next and (2) molecular genetics, the study of the genetic material that carries information from one generation to the next.

Course Learning Objectives

- Students will develop skills in critical reading of original scientific literature.
 - These skills will provide the tools necessary to read current professional literature in any field.
- Students will learn to participate actively in their own education by developing and conducting an independent research project.
 - Students will design experiments and generate and interpret their own data.
 - Students will understand the relationship between their experiments and concepts covered in class.
- Students will understand the role of genetics in defining biological processes.
- Students will come to understand how their level of understanding of a biological process increases by using a historical approach to science.
- Students will appreciate that recent advances in molecular biology are due to our ever increasing depth of understanding of basic biological processes.
- Students will understand the language of genetics and effectively communicate principles in both written and oral forms.
- Students will solve a variety of genetic problems using analytical skills.

This course supports the Educational Priorities and Outcomes of Cornell College with emphases on knowledge, inquiry, reasoning, communication, and vocation.

Instructors:

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Textbook:

iGenetics A Molecular Approach (3rd Edition) 2010
Peter Russell
Benjamin Cummings, Publishers

Meeting Times:

Lecture & Lab - 9:00-11:00 AM & 12:30 - 3:00 PM
1/22/19-1/24/19- We will start at 8:30 AM

Office Hours:

I have no organized office hours. I'm usually in my office after class until about 6:00 p.m. I can also arrange to meet with you in the evenings and/or on weekends. If you are having problems with the class, come and see me as soon as possible.

Grades:

Research Proposal	F	8/30	40 pts
Critique	T	9/3	40 pts.
Exam 1	F	9/6	100 pts.
Laboratory Research Paper	M	9/16	100 pts.
Oral lab reports	T	9/17	50 pts
Exam 2	W	9/18	100 pts.
			TOTAL 430 pts.

90-100%	A
85-89%	A-
80-84%	B+
75-79%	B
70-74%	B-
65-69%	C+
60-64%	C
55-59%	C-

Lecture & Lab Slides:

Slides used in lecture and lab are posted in Moodle (BIO 315). Please come to class with a hard copy of the slides or with the slides on your computer.

Exams:

The exams will be a combination of short answer questions (requires a paragraph or two) or problems. Scoring well on these exams will require that you understand the material and convey that understanding in a clear and concise manner. Copies of old exams can be found in Moodle or on my course web page (<http://people.cornellcollege.edu/ctepper/315.html>)

Problems:

I have assigned a set of homework problems from the textbook for most course topics. Additional homework problem sets will also be handed out in class. I have posted the answers to the textbook problems in Moodle (BIO 315) and the handout problems include answers. You will not have to hand in the solutions to these problems, nor will they be graded. Your exams consist of problems and if you expect to do well in this course, I **strongly** encourage you to complete these problems. If you are having trouble with the problems, please come and see me.

Attendance:

Lecture and lab: Students are expected to attend all lectures. If you have a legitimate reason for missing class or a deadline, e-mail me **BEFORE** class begins. Each unexcused absence will result in the loss of 10 points from your cumulative point total.

Lab: You are expected to be in lab during scheduled lab periods. You may only work on your research projects in the lab when one of the instructors is present. I will allow students to work in the lab from 8:15 – 9:00 AM (in order to start experiments with long incubation periods). Additionally, I will leave the lab open from 3:00 – 5:00 PM for experiments that require longer incubation and run times to complete. Attendance and effort in the lab will be taken into account when grades are determined.

Research Proposal

Research Paper Critique

Oral Lab Reports:

Research Paper:

Academic Honesty Expectations:

Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is submitted for credit, a student is asserting that the submission is her or his work unless there is a citation of a specific source. If there is no appropriate acknowledgement of sources, whether intended or not, this may constitute a violation of the College's requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Compass, our student handbook, under the heading "Academic Policies – Honesty in Academic Work."

Students with Disabilities:

Students who need accommodations for learning disabilities must provide documentation from a professional qualified to diagnose learning disabilities. For more information see <https://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml>

Students requesting services may schedule a meeting with the disabilities services coordinator as early as possible to discuss their needs and develop an individualized accommodation plan. Ideally, this meeting would take place well before the start of classes.

At the beginning of each course, the student must notify the instructor within the first three days of the term of any accommodations needed for the duration of the course.