BIOL 222: Principles of Genetics, Fall 2020

BIOL 222, 3.0 credits
ASYNCHRONOUS ONLINE FORMAT
Proficiency in Basic Requirement: BIOL 117*, BIOL 119*, MATH 112 or MATH 221, CHEM 119 OR CHEM 211
*Biology students with a D or less in BIOL 117 or BIOL 119 will be deregistered from BIOL 222
Note: this course counts for the Biology minor, but BIOL 271 (Heredity) does as well

Instructor

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ALL OFFICE HOURS WILL BE VIRUTUAL VIA ZOOM
GENERAL Office hours: Monday 10:00–11:30, Wednesday 11:30–1:00, and by appointment.
COURSE SPECIFIC Office hours: Monday 12:30-1:30 and Friday 12:30-1:30
Please take advantage of this, genetics is not easy but I'm HERE to help you!!!

Course Description

Principles of Genetics will provide students with a broad genetics background, and will cover topics ranging from understanding the flow of genetic information within single-celled organisms to how genes and gene products function within multicellular organisms.

Course Learning Objectives

- Students will be able to define basic genetics terms, and use these terms to explain fundamental concepts in genetics related to: nucleic acid structure, the central dogma, gene regulation in eukaryotes and prokaryotes, transmission genetics, and molecular genetics.

- Students will be able to describe specific examples of how advances in our understanding of genetics and molecular biology have impacted society

- Students will gain experience analyzing and interpreting data from genetics experiments, both from historical experiments and current genetics methods. In addition, students will be able to explain how model organisms are used to understand genetics principles, providing specific examples.

Textbook

The required textbook for this course is: Genetics: Analysis and Principles (6th Ed) (McGraw Hill, ISBN 978-1259616020, 2018)) by Robert J. Brooker. This text is available in the bookstore. If you have an older edition please let me know.

Calculator

You will need a calculator for all exams in this course.

Grading

5 Unit Exams	70 %
Homework Assignments (1 per class)	10 %
Canvas Quizzes (10-12 total)	15 %
Reflective Assignment	5 %

***Grade disputes must be initiated within one week from when the assignment was handed back

The following scale will be used to calculate final grades. Student point totals or grading scheme may be adjusted to reflect course difficulty or section differences at the instructor's discretion.

A (93-100%)	A- (90-92%)	
B+ (87-89%)	B (83-86%)	B- (80-82%)
C+ (77-79%)	C (73-76%)	C- (70-72%)
D (60-69%)		
E (<60%)		

Exams: There will be five (5) exams via Canvas.

***You will have only one attempt for each exam so please be sure you have good internet connection before you begin. You will be given 60 minutes to complete each exam.**
***If you are having any issues or concerns (technical or otherwise) during your exam you must contact me immediately during the exam so that I can moderate your particular exam. I will not be able to do so after you have completed the exam.**
***Make up exams will only be administered in special circumstances (e.g. qualified medical excuses). Exams cannot be missed and will not be able to be made up for any other reason including weddings, vacations, or travel.**
***Please note the exam dates for this course. If you have a legitimate scheduling conflict, you must notify me within the first 2 weeks of class. Otherwise, you will have to take exams as scheduled in the syllabus. If you are ill or have another unexpected issue come up, you must have approval for a make up exam before missing it, otherwise you cannot make up the exam.**

Group Homework:

Each lecture will be accompanied by a set of homework questions, and these questions are due by the end of the day before the next class (e.g. Monday's homework questions are due by Tues at 11:59 pm). You will submit your HW answers via Canvas. You will be graded on effort not on accuracy, meaning as long as you work through the questions you will receive full credit even if your answer is not correct. You are welcome to (and encouraged) work with other students on

these homework questions, and you can ask for help on the HW questions in office hours. An answer key will be provided after the HW due date.

***Homework answer with just a numerical value for an answer will not be accepted for credit. You must show your work in order to receive credit.**

Canvas Quizzes:
There will be 2-3 canvas quizzes per module (10-12 quizzes total). Please make sure to pay attention to the deadlines, which will be specified on canvas. Quizzes will be graded for accuracy and therefore you may not collaborate on the quiz or ask questions during office hours about a quiz until the quiz closes. The quizzes will be timed and you will only have one attempt at the quiz. Answers will be published after the quiz closes. Think of the quizzes as a low stress tool to assess your knowledge before an exam.

Reflective Assignment:
This assignment will be given at the end of the semester along with a grading scale that will be associated with the assignment. It will give you a chance to reflect on the course during the semester.

Important!! Pre-Biology Major and the C+ Policy: Please familiarize yourself with the new C+ policy, which may apply to some students in this course. To be able to declare a major in Biology/Biochemistry premajors must first earn **at least a C+ average** (2.3 GPA) in their **first two required biology lecture** courses **taken at Geneseo**. For most students this will be BIOL 117 and 119. However, if students have credit for BIOL 117 from an AP Biology score of 5, or for BIOL 117 and/or BIOL 119 from the transfer of college credits, one or both of the first two required courses can be BIOL 203 and/or BIOL 222 (for pre-Biology majors) or BIOL 222 and 300 (for pre-Biochemistry majors). Pre-Biology students who have credit for 117, 119, 203 and 222 and pre-Biochemistry students with credit for 117, 119 and 222 will be evaluated on the basis solely of BIOL 300.
[Note that although you can repeat courses if you withdraw or earn a D / E you **cannot** repeat courses with a C- or C and earning these grades in 'premajor course' makes it difficult to achieve a C+ average and to become a Biology/Biochemistry major.]

Accessibility
SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities. Accommodations will be made for medical conditions related to pregnancy or parenting. Requests for accommodations including letters or review of existing accommodations should be directed to the Office of Accessibility in Erwin Hall 22 or access@geneseo.edu or 585-245-5112. Students with letters of accommodations should submit a letter to each faculty member at the beginning of the semester and discuss specific arrangements. Additional information on the Office of Accessibility is available at https://www.geneseo.edu/accessibility-office.

Well-Being Prioritizing well-being can support the achievement of academic goals and alleviate stress. Eating nutritious foods, getting enough sleep, exercising, avoiding drugs and alcohol, maintaining healthy relationships, and building in time to relax all help promote a healthy lifestyle and general well-being.
Concerns about academic performance, health situations, family health and wellness (including the loss of a loved one), interpersonal relationships and commitments, and other factors can contribute to stress. Students are strongly encouraged to communicate their needs to faculty and staff and seek support if they are experiencing unmanageable stress or are having difficulties with daily functioning. The Dean of Students (585-245-5706) can assist and provide direction to appropriate campus resources. For more information, see www.geneseo.edu/dean_students.

Mental Health As a student, you may experience a range of challenges that can impact your mental health and thus impact your learning; common examples include increased anxiety, shifts in mood, strained relationships, difficulties related to substance use, trouble concentrating, and lack of motivation, among many others. These experiences may reduce your ability to participate fully in daily activities and affect your academic performance.
SUNY Geneseo offers free, confidential counseling for students at the Lauderdale Center for Student Health and Counseling, and seeking support for your mental health can be key to your success at college. You can learn more about the various mental health services available on campus at health.geneseo.edu.

Academic Integrity and Plagiarism Milne Library offers frequent workshops to help students understand how to paraphrase, quote, and cite outside sources properly. These sessions are meant to educate about the importance of using original ideas and language, and how to incorporate paraphrases and quotes into writing. The complete list of library workshops can be found at www.geneseo.edu/library/library-workshops.
Academic dishonesty includes cheating, knowingly providing false information, plagiarizing, and any other form of academic misrepresentation. College policies and procedures regarding academic dishonesty are available at www.geneseo.edu/handbook/academic-dishonesty-policy.

Tentative Schedule (subject to change):

Date	Subject	Required Reading
Aug 31	Introduction	
Sep 2	DNA as the Genetic Material	208-211
Sep 4	Nucleic Acid Structure I	211-224
Sept 7	**LABOR DAY – NO CLASSES**	
Sept 9	Nucleic Acid Structure II	211-224
Sept 11	Organization of DNA I	229-234
Sept 14	Organization of DNA II	234-248
Sept 16	Bacterial DNA replication	252-274

Sept 18	Eukaryotic DNA replication	252-274
Sept 21	Polymerase chain reaction (PCR), DNA sequencing	519-526
Sept 23	Mitosis and Meiosis	46-61
Sept 25	**EXAM 1**	
Sept 28	Chromosome Structure and Number	177-192
Sept 30	**NO CLASSES**	
Oct 2	Mendel's Laws of Inheritance	18-39
Oct 5	Mendel's Laws of Inheritance & Probability	18-39
Oct 7	Inheritance of sex chromosomes	64-71; 102-115
Oct 9	Extensions to Mendel	76-96
Oct 12	Genetic Linkage & Mapping I	127-141
Oct 14	**EXAM 2**	
Oct 16	Genetic Linkage & Mapping II	127-141
Oct 19	Bacterial Genetics I	155-170
Oct 21	Bacterial Genetics II	155-170
Oct 23	Molecular Technologies – Gene Cloning	511-519
Oct 26	Blotting Methods	529-531
Oct 28	Central Dogma	278-286; 306-309
Oct 30	Transcription - prokaryotes	278-286
Nov 2	Transcription - eukaryotes	286-290
Nov 4	**EXAM 3**	
Nov 6	RNA processing - eukaryotes	291-299
Nov 9	Translation	309-331
Nov 11	Translation	309-331
Nov 13	Gene regulation – prokaryotes I	336-348

Nov 16	Gene regulation – prokaryotes II	336-348
Nov 18	Gene regulation – eukaryotes I	361-379
Nov 20	Gene regulation – eukaryotes II	388-394; 400-408
Nov 23	**EXAM 4**	
Nov 25	**THANKSGIVING – NO CLASSES**	
Nov 27	**THANKSGIVING – NO CLASSES**	
Nov 30	Gene regulation – eukaryotes III	411-422
Dec 2	Mutations I	461-479
Dec 4	Mutations II	461-479
Dec 7	DNA Repair	479-486
Dec 9	CRISPR/Cas System	423-429
Dec 11	Genetics in Medicine I	624-636
Dec 14	Genetics in Medicine II	624-636
Dec 16	**Review Day/Practice Problems**	
Dec 18	**EXAM 5**	
Dec 21	**Reflective Assignment Due**	