BIOL 271: Heredity

Fall 2025, Bailey Hall 101

T/TH 12:30-1:45 (section 01)

Prerequisites:

At least one college level Biology course or permission of the instructor
Note: **This class *cannot* be used for credit toward the Biology major but does count for the Biology minor**.

Instructor:

Mr. Nathan Morris (he/him)
Office: ISC 139C
Email: nmorris@geneseo.edu
Phone: 585-245-6396
Office Hours: Monday: 1:30-2:30, Tuesday: 10-11, Wednesday: 12-1 or by appointment.

Course Description

Heredity reviews the principles of genetics and the many ways in which genetics and biotechnology affect our lives. The topics covered include transmission genetics, cytogenetics, DNA structure and function, biotechnology, population genetics, genetic disorders, mutations, and cancer, with a focus on human genetics.

Learning Outcomes:
At the conclusion of the course:
● Students will be able to explain the fundamental principles of transmission genetics, molecular genetics, and population genetics at the level appropriate for educated, non-biology majors.
● Students will be able to describe the causes, characteristics, and management strategies for common human genetic diseases.
● Students will have practiced problem solving, critical thinking, and communication skills with respect to genetic problems.
● Students will be able to describe and discuss current issues in genetics and biotechnology, and their relationships to fundamental genetic principles

Required Texts

Human Genetics: Concepts and Applications, 14th edition, by Ricki Lewis (McGraw Hill, ISBN-13: 9781265351281) is the main text for the course and is available in the bookstore as well as online to rent. You're welcome to use an older edition but please note that you're responsible for the material in the required version of the textbook.

Calculator

You'll need a simple calculator (with basic functions) in order to complete some assignments for the course. Graphing calculators are not permitted for exams.

Grading

Assignment	%
Exams (4 total)	50%
Homework Assignments (group; 1 per module)	15%
Semester Project	25%
Brainstorming and ideas (individual)	5%
Draft of project (group)	10%
Final project (group)	10%
Participation (random calling & in-class questions, 2 dropped)	10%

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.

	B+ 87.0-89.9%	C+ 77.0-79.9%		
A 93.0-100%	B 83.0-86.9%	C 73.0-76.9%	D 60.0-69.9%	E <60%
A- 90.0-92.9%	B- 80.0-82.9%	C- 70.0-72.9%		

Standard rounding procedures will apply. For example, an 82.4 would be rounded to a B-, and an 82.5 would be rounded to a B.

Grade disputes must be initiated within one week from when the assignment was handed back. If you have a grade dispute, you must submit your original assignment along with a written justification of your answer.

Late Assignments

Late assignments will have a 10% grade reduction per day, and will not be accepted more than 2 days late.

Participation

Within each lecture there will also be practice problems and questions, and part of your grade is determined by participation in class discussions. I will randomly call on individuals to answer a

question or contribute to discussions, and you earn points by participating. You are not penalized for incorrect answers or for asking for help from other students.

Exams

Make up exams are not administered without prior approval to missing the exam. Safety is a priority, and please do not attend class or an exam if you have tested positive for COVID or are very ill. It is your responsibility to be in contact with me for (1) approval to miss the exam and (2) scheduling a make-up exam. Exam format: exams will be administered in class (75 min). There will not be a cumulative final exam.

Please pay attention to the exam dates for this course NOW. 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.

Getting help

Please do not hesitate to reach out for help during this course. The goal of this course is for you to *learn* about genetics. The learning materials, exams and homework assignments that I provide to you are designed to promote that learning. I also aim to provide clear guidelines on how to succeed in this course. If at any point you feel that a topic, assignment or expectation is unclear, please reach out! I *want* to hear from you. I want to help. I want you to enjoy this course! I have office hours (listed above) and will try to accommodate other times as well.

Accessibility

SUNY Geneseo is dedicated to providing an equitable and inclusive educational experience for all students. The Office of Accessibility will coordinate reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities, as well as medical conditions related to pregnancy or parenting. Students with letters of accommodation should submit a letter to each faculty member at the beginning of the semester and discuss specific arrangements. Please contact the Office of Accessibility Services for questions related to access and accommodations: Erwin Hall 22, (585) 245- 5112, access@geneseo.edu, https://www.geneseo.edu/accessibility-office).

Use of AI and writing assignments

Artificial Intelligence is here, and it is here to stay! I think it's important to talk about my expectations, and the potential significant academic dishonesty issues that can arise. I strongly recommend not using AI when completing your coursework for several reasons: (1) if you don't complete assignments yourself, you are not learning. Learning about genetics is the point of taking this course. (2) AI is not an expert in genetics or biology in general and will likely be prone to significant errors in writing assignments. These errors will be obvious to me as your instructor. If you do use AI to generate any text you must cite the program used in a works cited section. Assignments containing text written by AI will not receive full credit compared to

assignments that contain original work. Using AI-written work without citing it constitutes an academic dishonesty violation (see section below).

Academic Dishonesty & Plagiarism

Students are expected to adhere to the University's policy on academic dishonesty and plagiarism, located in the student handbook. Academic dishonesty and plagiarism have serious consequences, and if you're struggling in class, please ask for help rather than resort to academic dishonesty! Academic dishonesty will result in a zero on the assignment or exam. In addition, a report will be filed to the department chair and Dean of the College, and a record of academic dishonesty will be placed in the student's file at the Dean of Students Office.

Please refer to the following link for more details:
https://www.geneseo.edu/advising/policies#AcademicDishonestyandPlagiarism

Diversity and Equity

It is my intent to create a learning environment that supports all students. I believe the diversity that you bring to this class should be viewed as a resource, strength, and benefit. I strive to present materials and activities that are respectful of gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture. Your suggestions are encouraged to improve the course's effectiveness personally, or for other students or student groups. I recognize that this feedback may not be easy to give. I will listen to feedback in whatever form it is given and work to be mindful of my own power and privilege. For ideas, questions, or concerns related to diversity, equity, and inclusion in the Biology Department, please reach out to bio-diversity@geneseo.edu.

Schedule for class dates

Content covered, as well as the assigned readings, for the semester. Subject to change at instructor's discretion.

Date	Subject	Assigned Textbook Reading
(T) 08/26	Introduction to the course *Begin Module 1* Information - how do we make a cell?	-
(Th) 08/28	Information - how do we make a cell, continued?	Ch 9.1-9.2 Ch 13.1-13.2
(T) 09/02	How does a cell copy and transmit information? Part 1: Replication	Ch 9.3
(Th) 09/04	How does a cell copy and transmit information? Part 2: Cell Division (Mitosis, Meiosis, & Stem Cells)	Ch 2.3-2.4 Ch 3.2
(T) 09/09	How to convert DNA into other molecules: transcription (DNA→RNA), & translation (RNA→protein)	Ch 10
(Th) 09/11	Gene Expression: How do we make only some of the DNA into RNA and/or protein? **HW #1 due**	Ch 11
(T) 09/16	Review session	-
(Th) 09/18	**EXAM 1**	-
(T) 09/23	*Begin Module 2* Genetics of Development in Humans	Ch 3.3-3.6

(Th) 09/25	Simple Mendelian Genetics Part 1 **Semester Project Individual Portion Due**	Ch 4
(T) 09/30	Simple Mendelian Genetics Part 2	Ch 4
(Th) 10/02	Extensions to Mendelian Genetics Part 1	Ch 5
(T) 10/07	Extensions to Mendelian Genetics Part 2 **HW #2 due**	Ch 5
(Th) 10/09	Review Session	-
(T) 10/14	**No Classes Fall Break**	-
(Th) 10/16	**EXAM 2**	-
(T) 10/21	*Begin Module 3* Genetics and Sex and Gender	Ch 6
(Th) 10/23	Complex Traits	Ch 7
(T) 10/28	Mutations and Cancer **Semester Group Project Draft due**	Ch 12 Ch 20.1
(Th) 10/30	Chromosomal Variation	Ch 13.3-13.5
(T) 11/04	Genetics of ancestry and race **HW #3 due**	-
(Th) 11/06	Review Session	-

(T) 11/11	**EXAM 3**	-
(Th) 11/13	*Begin Module 4* Population Genetics, allele frequencies and how they change over time	Ch 15
(T) 11/18	Genome sequencing & personalized medicine part 1	Ch 14 Ch 9.4
(Th) 11/20	Genome sequencing & personalized medicine part 2	Ch 14 Ch 9.4
(T) 11/25	Genetics and human behavior, part 1	Ch 8
(Th) 11/27	**No classes - Thanksgiving**	-
(T) 12/02	Genetics and human behavior, part 2 **Final Semester Project due**	Ch 8
(Th) 12/04	Semester project showcase **HW #4 due**	-
Thursday 12/11	**Exam 4 – Bailey Hall 101, 12:00-2:30 pm**	-