

Biology 271: Heredity, Spring 2021

Biology 271, 3.0 credits

Tuesday and Thursday 1:00 PM – 2:15 PM

Online Synchronous (Canvas) Format

Prerequisites: college level biology course or permission

Note: This class CANNOT be used for credit toward the biology major but can be used for the biology minor!

Instructor

Dr. Hristina Nedelkovska

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ALL OFFICE HOURS WILL BE VIRUTUAL VIA ZOOM

GENERAL Office hours: Monday 10:30–11:30, Wednesday 12:30–1:30, Thursday 11:00-12:00 and by appointment.

COURSE SPECIFIC Office hours: Tuesday and Thursday (during designated class time)

Please take advantage of this, genetics is not easy but I'm HERE to help you!!!

Course Description

Heredity (Biology 271) reviews the principles of human 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. Student groups will investigate current topics in genetics and present their work to the class followed by discussion.

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 both generally and with respect to genetic problems.
- Students will be able to describe current issues in genetics and biotechnology, and explain how they shape society.
- Students will be able to describe the fundamental genetic principles underlying current issues in genetics and biotechnology.

Textbook

Human Genetics: Concepts and Applications, 11th edition (you can also use other editions), by Ricki Lewis (McGraw Hill, ISBN-13: 978-0073525365) is the main text for the course and is available in the bookstore as well as online to rent. There is a case study manual for this text as well, but we will not be using it.

Grading

4 examinations @ 100 points each	70 %
Student Presentation (1 per person)	10 %
Homework	10 %
Questions of the Day/Worksheets	8 %
Reflective Assignment	2 %
	100% total

The following scale will be used to calculate final grades.

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 four unit exams worth 100 points each and exams will be administered online through Canvas. There will NOT be a cumulative final.

***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 80 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.**

Questions of the Day/Worksheets: I will give a “question of the day” or a worksheet to be completed “in class” on most days. We will work in random breakout groups to complete these questions. These must be submitted in Canvas before the next class for student to get full credit.

***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.**

Group Presentations: Groups of 3-4 students will investigate one of the topics listed below and present their findings to the class. Each group will give a 10 minute, illustrated and engaging presentation to the class, and will have 5 minutes to answer questions and lead class discussion on the topic. **A one to two page written summary of the topic will be turned in by the group on the day of the presentation.** Make sure you include citations and references both in your summary and presentation (please use reputable sources). The presentation should be illustrated, focused and interesting. In addition to the professors evaluation there will also be a student evaluation component that will be integrated into the final score for the presentation. The presentation and summary will be worth a total of 50 points. Importantly your peer review of a different group also counts toward your grade and if you fail to complete it on the assigned day you will lose 5 points

from your total presentation grade.

Below is a marking guide that will be used to evaluate the group presentations:

Rate each of the following areas on a scale from 1-5

1 = poor 2 = fair 3 = good 4 = very good 5 = excellent

Category	Rating	Comments
CONTENT Content appropriate and accurate, is it in logical order, are sources identified, etc		
ORGANIZATION Presentation easy to follow, divided into appropriate sections, are there good transitions between slides/topics, coherent, flows logically etc		
DELIVERY Speaks clearly, all members were well prepared, did not just read from notes etc		
CREATIVITY Kept audience engaged, used visual aids, original presentation, etc		
GROUP DISCUSSION Led discussion well, interacted with audience, was able to answer questions etc		

Presentation Topics (for presentation dates please refer to class schedule below):

1. Genetic counselor as a profession
2. Genetic testing, GINA
3. Gene patents
4. Genetics in art and literature
5. Preimplantation genetic diagnosis
6. Behavior disorder: Autism
7. GMO Foods
8. Recombinant Drugs
9. Gene Therapy
10. Molecular Clocks, mtDNA and human evolution
11. Cancer

Homework: Each lecture will be accompanied by a set of homework questions, and these questions are due before the start of the next class. 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. An answer key will be provided after the HW due date. Consider this a low stakes assessment tool, which should prepare you for the exams!

***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.**

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.

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.

Date	Subject	Required Reading
Feb. 2	DNA and Chromosomes Structure	Ch. 9.1, 9.2, 13.1, 13.2
Feb. 4	DNA Replication, PCR	Ch. 9.3, 19.2
Feb. 9	Mitosis, Stem Cells	Ch. 2
Feb. 11	Transcription	Ch. 10
Feb 16	Translation Genetic Counselor 20 (396-98)	Ch. 10
Feb 18	Maximizing Genetic Information	Ch. 2
Feb. 23	Jeopardy/Review Genetic Testing 1 (1,12,14), 20 (398-401)	
Feb. 25	Exam 1 Ch. 2, 9, 10, 13.1-13.2, 19.2	
March 2	REJUVINATION DAY	
March 4	Meiosis	Ch. 3.1-3.3
March 9	ARTS, Gene Expression PGD 21 (422-426)	Ch. 11, 21.3
March 11	Human Development	Ch. 3.4-3.6
March 16	Chromosomal Abnormalities Gene Therapy 20 (395, 402-410)	Ch. 13.3-13.5
March 18	Mendel Genetics Art and Literature	Ch. 4
March 23	Mendel	Ch. 4
March 25	Jeopardy/Review Molecular clocks 16 (323-329)	
March 30	Exam 2 Ch. 3, 4, 11, 13.3-13.5, 21.3	
April 1	Beyond Mendel's Laws	Ch. 5
April 6	Beyond Mendel's Laws Schizophrenia 8 (162-164)	Ch. 5
April 8	Solving Linkage Problems Autism 8 (154, 159-160)	Ch. 5.4
April 13	Sex	Ch. 6
April 15	Multifactorial Traits	Ch. 7
April 20	Solving Linkage Problems/Review GMO Foods 1 (12-13)	
April 22	REJUVINATION DAY	
April 27	Exam 3 Ch. 5, 6, 7	
April 29	Genetic Technologies Gene Patents 19 (378-380)	Ch. 19
May. 4	Genomics Recombinant Drugs 19 (358-88)	Ch.22
May. 6	Allele Frequencies	Ch. 14
May. 10	Gene Mutations	Ch. 12
May. 12	Cancer Cancer	Ch. 18
May. 18 12:00-2:30	Exam 4 Ch. 19, 22, 14, 12, 18	