

## **Genetics (2 credits)**

New Mexico Institute of Mining and Technology  
MST Program--online

### **INSTRUCTOR:**

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### **COURSE DESCRIPTION:**

An overview of the storage, transmission and expression of biological information.

This course introduces basic concepts in prokaryotic and eukaryotic genetics, including genome organization, DNA replication, recombination, repair, and regulation of gene expression. Topics considered include the genetic basis of heredity, the fundamental role of DNA recombination, repair, and mutagenesis in creating genetic variability within populations, and the importance of genetic variability and natural selection in the ongoing process of evolution.

**PREREQUISITES:** ST 523/523D or departmental waiver

**PLACE IN CURRICULUM:** This course is an elective for the Biology distribution requirement in the Master of Science for Teachers program.

### **COURSE GOALS:**

- To introduce the principles of transmission of genetic traits
- To teach the molecular basis of genetic transmission and structures involved
- To introduce current genetic trends in medicine, molecular biology and biotechnology
- To teach principles of genetic technologies and their applications

### **STUDENT LEARNING OUTCOMES:**

After completion of this course, students are expected to be able to

- Describe and apply principles of classical genetics, molecular biology and biotechnology
- Understand the molecular basis of inheritance, and the biomedical implications
- Appreciate the implications of genetic technologies in current problems in human health
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### **COURSE REQUIREMENTS:**

**Required textbook:** Introduction to Genetic Analysis, 10<sup>th</sup> or 11<sup>th</sup> edition, Griffiths, Wessler, Carroll and Doebly.

**Lectures:** The principles of genetics will be presented in 29 lectures of approximately 1 hour each. The lectures will follow from selected chapters of the textbook. Reading the corresponding chapter is highly recommended. It is recommended to view two lectures per week.

**Assignments:** Homework will be assigned approximately every two lectures, by chapter in the book, and should be submitted by the end of the following week (in other words, the first two lectures should be viewed in the first week; the homework for those lectures will be due midnight Friday of the second week). There will be two exams of equal weight, each covering approximately 1/2 of the course material. The first exam must be completed by the end of the 7th week of the semester (Midnight Friday February 28, 2020) and will cover material up through Lecture 12. The final exam must be completed by the end of finals week, which is April 30-May 5, 2020. All exams must be proctored by a responsible party. Students must submit the name, title, and email of the responsible

party before the last day to add classes (no exceptions). Failure to provide a proctor will result in being dropped from this class.

Cheating (including plagiarism) will not be tolerated. Homework assignments are for the benefit of the student, and copying answers from other students or the internet is not acceptable. It is perfectly acceptable to use online resources or discussions with other students to formulate your answers, but they must be in your own words.

**Grading:**

Homework:	40%
Exam 1:	30%
Final exam:	30%

**Counseling and Disability Services:**

**Reasonable Accommodations**

New Mexico Tech is committed to protecting the rights of individuals with disabilities. Qualified individuals who require reasonable accommodations are invited to make their needs known to the Office of Counseling and Disability Services (OCDS) as soon as possible. To schedule an appointment, please call 835-6619.

**Counseling Services**

New Mexico Tech offers mental health and substance abuse counseling through the Office of Counseling and Disability Services. The confidential services are provided free of charge by licensed professionals. To schedule an appointment, please call 835-6619.

**Academic Honesty:** New Mexico Tech's Academic Honesty Policy for undergraduate and graduate students is found in the student handbook, which can be found at: <http://www.nmt.edu/student-handbook>

You are responsible for knowing, understanding, and following this policy.

**Respect Statement:** New Mexico Tech supports freedom of expression within the parameters of a respectful learning environment. As stated in the New Mexico Tech Guide to Conduct and Citizenship: "New Mexico Tech's primary purpose is education, which includes teaching, research, discussion, learning, and service. An atmosphere of free and open inquiry is essential to the pursuit of education. Tech seeks to protect academic freedom and build on individual responsibility to create and maintain an academic atmosphere that is a purposeful, just, open, disciplined, and caring community."

**Tentative Schedule**—Please note that homework is organized by chapter in the book. Some lectures cover additional problems for a chapter in the next lecture (see “Material covered in lecture” below). In other words, you may want to watch the beginning of the next lecture before starting the homework, in those cases where the problems go into the next week. It is perfectly all right to deviate from the due date of the homework, as I realize that all of you have lives and jobs. However, the homework will automatically close on the due date unless you ask me to reopen it for you.

Week/dates	Lecture #	Material covered in lecture	Chapter homework	Homework due
1 1/13-1/17	1 and 2	Intro, Ch. 1, Ch. 2	Ch. 1	1/17, 1/24
2 1/20-1/24	3 and 4	Ch. 2	Ch. 2	1/31
3 1/27-1/31	5 and 6	Ch. 3	Ch. 3	2/7
4 2/3-2/7	7 and 8	Ch. 4	Ch.4	2/14
5 2/10-2/14	9 and 10	Ch. 4 probs/Ch. 6	Ch. 6	2/21
6 2/17-2/21	11 and 12	Ch. 6 probs/Ch. 7	Ch. 7	2/28 Midterm due
7 2/24-2/28	13 and 14	Ch. 8	Ch. 8	3/6
8 3/2-3/6	15 and 16	Ch. 9	Ch. 9	3/13
9 3/9-3/13	17 and 18	Ch. 9 probs/Ch. 11	Ch. 11	3/20
10 3/16-3/20	19 and 20	Ch. 11 probs/Ch. 12	Ch. 12	3/27
11 3/23-3/27	21 and 22	Ch. 12 probs/Ch.15	Ch. 15	4/3
12 3/30-4/3	23 and 24	Ch. 16	Ch. 16	4/10
13 4/6-4/10	25 and 26	Ch. 17, Ch. 18	Ch. 17	4/17
14 4/13-4/17	27 and 28	Ch. 18, Ch. 10	Ch. 18	4/24
15 4/20-4/24	29	Ch. 10	Ch. 10	5/1