

GENE 315 - Molecular Genetics Fall 2021

Lecture: 9:00 - 10:15am TU and TH, Skeen Hall, Room W139

Instructor: Dr. Ian Ray Phone: 646-3819
Rm 342N, Skeen Hall Email: iaray@nmsu.edu

Office Hours: Face-to-face @ Dr. Ray's office or via Zoom: M & W 4:30 to 6:00pm, or by appointment.

Textbook: Genetics: Analysis & Principles (6th edition), by R.J. Brooker, 2018, ISBN 978-1-259-61602-0.

Course Goals: To provide detailed coverage of the central concepts of genetics from a molecular perspective. Topics to be covered include DNA structure/function, replication/repair, transcription, translation, gene regulation, DNA recombination at the molecular level, genomics and biotechnology.

Preparing For Each Class: Lecture notes with missing information (i.e. fill in the blank), and Powerpoint® slides that provide the missing information, are available via Canvas modules for each chapter. **PRIOR TO EACH CLASS** students are expected to read these materials and assigned textbook chapters (see course schedule next page), and to fill in the missing information in their notes. To guide your preparation time at home, we will typically cover 4 to 5 pages of lecture notes per class period. **While Powerpoint slides can be viewed in Canvas, please be aware that they will NOT be animated which means some important information will not be visible. Hence, be sure to download each Powerpoint file and view directly in Powerpoint as a slide show.** For questions about Canvas, contact NMSU Academic Technology (<https://learning.nmsu.edu/>).

During class as we review a given topic, I will randomly select students and ask them to provide missing information in the notes, or to describe a particular concept or process. If you participate, even with an occasional incorrect answer, you will receive full credit (see grading below). So, think of our class time as an informal quiz time. In addition, I want to use class time to clarify any concepts that you may have struggled with. Attending class regularly will help you stay up-to-date on studying course content. **Past experience indicates that >95% of students who don't regularly attend class will either withdraw from the course or fail the course.** Also, please take advantage of my office hours to discuss/clarify concepts covered in class (see above).

Study Habits: Given the volume and complexity of the information covered in this class, it is imperative that your personal reading, studying, and review of the material maintain pace with that of the course lectures. **I recommend that at the end of each week you make sure that you have studied and understand all the material covered during the week, and review all material covered since the previous exam (please read Study Cycle module).** If you fall behind in your studies, you will find it VERY difficult to catch up, and won't be able to successfully participate in class.

Grading: Attendance/participation (see above), 10%. There will also be four exams, where the lowest exam score will be worth 15% of the course grade and the remaining exams worth 25% each.

Problem Sets, and Study Questions: You are strongly encouraged to utilize the problem sets and insights resources (i.e. Solved Problems, Conceptual Questions, & Experimental Questions) provided at the end of each chapter. These resources will strengthen your understanding of the course material, and consequently, benefit your performance on the exams. Answers to ALL the problem sets and questions are provided in the "Brooker Textbook All Chapters Answer Key" module in Canvas.

Examinations: Exam content will focus ONLY on material covered in class and will consist primarily of essay type questions with a few short answer, multiple choice, and matching questions. Essay-based answers should provide sufficient written/diagrammatic details to clearly demonstrate that you fully understand a given concept. All exams will be administered in class during regularly scheduled class time and you will have 75 minutes to complete the exam.

Class policies: **Missed exams** may be taken within one week from the exam date provided a valid excuse is presented. You must notify Dr. Ray by phone, voicemail, or email **BEFORE** the exam is missed, & subsequently present a valid justification (e.g. illness requiring doctors care or school-related activity). You will receive a zero for any missed exams.

Academic misconduct: The Student Code of Conduct defines academic misconduct, non-academic misconduct and the consequences or penalties for each. The Student Code of Conduct is available in the NMSU Student Handbook online: <http://studenthandbook.nmsu.edu/>. Academic misconduct is explained here: <http://studenthandbook.nmsu.edu/student-code-of-conduct/academic-misconduct/>.

COURSE SCHEDULE
Molecular Genetics – GENE 315
Fall 2021

<u>DATE</u>	<u>LECTURE TOPIC</u>	<u>AFFILIATED READING IN TEXT</u>	
August	19	Overview of Genetics	Chapter 1
	24	Molecular Structure of DNA/RNA	Chapter 9
	26	Chromosome Organization and Structure	Chapter 10
	31	Chromosome Organization and Structure	Chapter 10
September	2	DNA Replication	Chapter 11
	6	Labor Day Holiday	
	7	DNA Replication	Chapter 11
	9	Gene Transcription & RNA Modification	Chapter 12
	▶ 14	EXAM I (thru 9/7 lecture)	
	16	Gene Transcription & RNA Modification	Chapter 12
October	21	Gene Transcription & RNA Modification	Chapter 12
	23	Translation of mRNA	Chapter 13
	28	Translation of mRNA	Chapter 13
	30	Translation of mRNA	Chapter 13
	5	Gene Regulation in Bacteria	Chapter 14
	7	Gene Regulation in Bacteria	Chapter 14
	▶ 12	EXAM II (thru 10/5 lecture)	
	14	Gene Regulation in Eukaryotes I	Chapter 15
	▶ 18	Last day to withdraw from course with a “W”	
	19	Gene Regulation in Eukaryotes I	Chapter 15
November	21	Gene Regulation in Eukaryotes II	Chapter 16
	26	Non-Coding RNAs	Chapter 17
	28	Gene Mutation and DNA Repair	Chapter 19
	2	Gene Mutation and DNA Repair	Chapter 19
	4	Recombination, Immunogenetics and Transposition	Chapter 20
	▶ 9	EXAM III (thru 11/2 lecture)	
	11	Recombination, Immunogenetics and Transposition	Chapter 20
	16	Molecular Technologies	Chapter 21
	18	Molecular Technologies	Chapter 21
	☺ 22-26	Thanksgiving Holiday	
December	30	Biotechnology	Chapter 22
	2	Biotechnology	Chapter 22
	9	Exam IV (thru 12/2 lecture: 8:00 to 10:00 AM)	

COVID-19 Safe Practices: To minimize the public health risk of COVID-19 at **NMSU, students, staff, and faculty are strongly encouraged to become vaccinated as soon as possible**, and our faculty and staff are expected to comply with the following safety commitment:

- I will become vaccinated against COVID-19 as soon as possible, but no later than Sept. 30, 2021.
- If I am unable or unwilling to become vaccinated, I will provide proof of a negative COVID-19 test on a weekly basis as directed.
- I will follow state and federal guidance for mask-wearing and other health safety measures based on my vaccine status.
- I will stay home if I have **symptoms of COVID-19** or any illness.
- If I have a positive test for COVID-19, I will:
 - immediately notify my supervisor and Aggie Health and Wellness (575-646-7375 or campus_health@nmsu.edu), and
 - fully participate in contact tracing.

Anyone failing to meet any of these expectations may be subject to corrective action under university policies. Recommendations relating to COVID-safe practices will be updated in alignment with guidance from the [New Mexico Department of Health](#). Changes will be communicated to the university community through our [NMSU Now newsletter](#), campus-wide memos, and other communications as appropriate.

NMSU continually reassesses and adjusts its operational plans based on guidance from both the [New Mexico Department of Health](#) and the [New Mexico Higher Education Department](#). Our campuses will follow this guidance, and may implement more-restrictive measures if our data indicates it is in the best interest of our students and employees.

In the classroom, students are also expected to:

1. Sit in your assigned seat
2. Wear your face mask
3. No food or drink
4. Wipe down your desk and chair as you leave class

Additional information available at: <https://now.nmsu.edu/plan/nmsu-covid-19-safety-commitment.html>

Discrimination and Disability Accommodation: Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act Amendments Act (ADA) covers issues relating to disability and accommodations. If a student has questions or needs an accommodation in the classroom (all medical information is treated confidentially), contact: Main Campus Student Accessibility Services (SAS) Corbett Center Student Union Room 208 Jesse Haas, Interim Director, 575-646-6840, sas@nmsu.edu.

New Mexico State University, in compliance with applicable laws and in furtherance of its commitment to fostering an environment that welcomes and embraces diversity, does not discriminate on the basis of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex (including pregnancy), sexual orientation, spousal affiliation, or protected veteran status in its programs and activities, including employment, admissions, and educational programs and activities. Inquiries may be directed to Laura Castille, Executive Director, Title IX and Section 504 Coordinator, Office of Institutional Equity, P.O. Box 30001, E. 1130 University Avenue, Las Cruces, NM 88003; 575.646.3635; 575-646-7802 (TTY); equity@nmsu.edu. Title IX prohibits sex harassment, sexual assault, intimate partner violence, stalking and retaliation. For more information on discrimination or Title IX, or to file a complaint contact: Laura Castille, Executive Director and Title IX Coordinator Office of Institutional Equity (OIE) – O'Loughlin House, 1130 University Avenue Phone: (575) 646-3635 E-mail: equity@nmsu.edu Website: <http://equity.nmsu.edu/>.