GENE 315 - Molecular Genetics
Fall 2020

Lecture: 9:00 - 10:15am TU and TH synchronously online via Canvas/Zoom

Instructor: Dr. Ian Ray
Rm 342N, Skeen Hall
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Office Hours: Virtual via Zoom or conference call: 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 ZOOM 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/).

I will record attendance for each of our Zoom lectures. If you will attend class from a different time zone, be sure to account for the fact that all meetings times refer to U.S. Mountain Time. If computer/internet problems prevent your attendance, notify me as soon as possible for an excused absence, and be sure to take quick action to resolve the problems you are encountering (e.g. use of Ethernet hardline, WiFi hotspots, or contact Student Technology https://studenttech.nmsu.edu/). My purpose in requiring you to attend this course synchronously with me (i.e. "virtually face-to-face") is to encourage you to participate, connect with fellow classmates, and to ask questions about subject matter that requires clarification. I also hope that 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.** 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. So, think of our class time as an informal quiz time. If you have questions about course content, please use the chat box to send me a question or raise your hand (electronically). Also, please take advantage of my office hours (see above). If I get wrapped-up discussing a given topic in class, and forget to check the chat box or reaction images, please feel free to unmute your microphone, interrupt me, and ask your question(s).

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. Exam answers should provide sufficient detail to clearly demonstrate that you fully understand the concept being queried.** Canvas will administer each exam and you will have 75 minutes to complete it. Before taking your first exam, you need to select the Lockdown Browser menu tab in this Canvas course and install the necessary software (including Respondus Monitor). For all exams you will be required to use both the lockdown browser and a webcam monitor. **Make sure you have access to a webcam on the 4 exam dates.** I realize that many students do not need to have such security constraints imposed because you recognize the importance of honesty and integrity in everything that you do. I am reminded of the words of legendary UCLA basketball coach John Wooden — 'The true test of a [person's] character is what they do when no one is watching'. However, I will be using the lockdown browser & monitor security measures to help increase the overall credibility of all online courses that NMSU offers.

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 2020

DATE		LECTURE TOPIC	AFFILIATED READING IN TEXT
August	20	Overview of Genetics	Chapter 1
	25	Molecular Structure of DNA/RNA	Chapter 9
	27	Chromosome Organization and Structure	Chapter 10
September	1	Chromosome Organization and Structure	Chapter 10
	3	DNA Replication	Chapter 11
	7	**Labor Day Holiday**	
	8	DNA Replication	Chapter 11
	10	Gene Transcription & RNA Modification	Chapter 12
►	**15**	**EXAM I (thru 9/8 lecture)**	
	17	Gene Transcription & RNA Modification	Chapter 12
	22	Gene Transcription & RNA Modification	Chapter 12
	24	Translation of mRNA	Chapter 13
	29	Translation of mRNA	Chapter 13
October	1	Translation of mRNA	Chapter 13
	6	Gene Regulation in Bacteria	Chapter 14
	8	Gene Regulation in Bacteria	Chapter 14
►	13	**EXAM II (thru 10/6 lecture)**	
	15	Gene Regulation in Eukaryotes I	Chapter 15
►	**16**	**Last day to withdraw from course with a "W"**	
	20	Gene Regulation in Eukaryotes I	Chapter 15
	22	Gene Regulation in Eukaryotes II	Chapter 16
	27	Non-Coding RNAs	Chapter 17
	29	Gene Mutation and DNA Repair	Chapter 19
November	3	Gene Mutation and DNA Repair	Chapter 19
	5	Recombination, Immunogenetics and Transposition	Chapter 20
►	10	**EXAM III (thru 11/3 lecture)**	
	12	Recombination, Immunogenetics and Transposition	Chapter 20
	17	Molecular Technologies	Chapter 21
	19	Molecular Technologies	Chapter 21
☺	**23-27**	**Thanksgiving Holiday**	
December	1	Biotechnology	Chapter 22
	3	Biotechnology	Chapter 22
	10	**Exam IV (thru 12/3 lecture: 8:00 to 10:00 AM)**	

COVID-19 Safe Practices: Although this course is only being offered online in fall 2020, I am including within the Canvas GENE 315 syllabus module, the following additional information that **you must read within the 1st week of class**. These include the **NMSU Ready - Crimson Commitment Video and Statement**, as well as, the **NMSU READY Crimson Commitment Classroom COVID-19 Safe Practices Acknowledgement Form**. This information is being provided in the event that you are enrolled in main campus courses that will meet face-to-face. You may use the acknowledgement form for whatever course you need to.

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/.