

BIOLOGY 482: INTRODUCTION TO MOLECULAR GENETICS

SPRING SEMESTER, 2011

Instructor: Dr. Karl J. Fryxell (Associate Professor, School of Systems Biology)

Course meets Tuesdays, 4:30 - 7:10 pm in Fine Arts Building room B108

Office hours: Thursdays, 2-4 pm in Discovery Hall room 305 (Prince William campus)

Office phone (703) 993-1069. E-mail kfryxell@gmu.edu (please use subject line "BIOL 482" in all e-mails)

Course web site: <http://mason.gmu.edu/~kfryxell/biol482>

<u>Date</u>	<u>Topic</u>	<u>Snustad</u>	<u>Latchman</u>
January 25	DNA structure	chapter 9	
February 1	DNA supercoiling, chromatin structure, and remodeling	chapter 9	chapters 2-3
February 8	Replication of DNA and chromosomes	chapter 10	
February 15	Transcription and RNA processing	chapter 11	chapter 4
February 22	Translation, mutations, DNA repair, and recombination	chapters 12-13	
March 1	Techniques of molecular genetics	chapter 15	
March 8	Midterm Examination	cumulative	
March 15	Spring Break		
March 22	Genomics	chapter 16	
March 29	Applications of molecular genetics	chapter 17	
April 5	Transposable genetic elements	chapter 18	
April 12	Transcription regulation in prokaryotes	chapter 19	
April 19	Transcription regulation in eukaryotes	chapter 20	chapter 5
April 26	Gene control and cellular signaling pathways		chapter 8
May 3	Gene regulation during embryonic development	chapter 21	chapter 9
May 17	Final Examination (4:30 pm - 7:15 pm)	cumulative	

Course Aim and Prerequisites: This course is intended for advanced undergraduate students. It is focused on the structure and function of genes at the molecular level. Topics such as DNA replication, chromosome structure, gene expression, mutation, DNA repair and transposable elements are covered in molecular detail. We aim to give students an understanding of the molecular structures that cause these functions, as well as the some of their applications in modern research laboratories and in the biotechnology industry. The required prerequisites are BIOL 213 (Cell Structure and Function), 305 (Biology of Microorganisms) and 306 (Biology of Microorganisms Laboratory). However, we strongly recommend that students have additional background in genetics (BIOL 311), organic chemistry (CHEM 313) and biochemistry (BIOL 483).

Readings: Readings will be assigned in the required text (*Principles of Genetics* by Snustad and Simmons, 5th ed, 2009). The recommended text for further reading is *Gene Control* by Latchman.

Grading and Course Policies: There will be one midterm examination (40%) and one cumulative final examination (60%). The format will be short answer and short essay questions, similar in scope to study questions posted on the course internet site (<http://mason.gmu.edu/~kfryxell/biol482>).

Makeup examinations (or prior examinations) will not be offered unless the student has received prior permission from the instructor and agrees to take a different (and more difficult) version of the examination than the rest of the class. In this regard, "prior permission of the instructor" means a direct, two-way conversation between professor and student. If a student simply announces (by e-mail, voice mail, FAX, notes, etc.) that they are not coming to the examination, that does not constitute permission. In this case, the student will receive a grade of zero.