Point Loma Nazarene University, Biology Department
BIO 662: Genetics and Molecular Biology
Summer 2017

PLNU Mission
To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Course description for BIO662 (3 units)
Concepts in genetics and molecular biology, including inheritance, organization, variability and expression of genes, with emphasis on the regulatory mechanisms that govern gene expression in eukaryotic and prokaryotic cells, are addressed from the perspective of teaching for conceptual understanding. Lecture and lab.

Course learning outcomes
Students will be able to

1) analyze the genetics and cell biology of cancer,
2) apply basic concepts of DNA replication by using contemporary cloning techniques,
3) analyze a case study relating genetics and molecular biology to a complex genetic trait,
4) utilize Chimera, a molecular imaging program, to better understand DNA repair,
5) conduct laboratory investigations in genetics and molecular biology, and
6) analyze data and formulate conclusions for each lab investigation.

Course credit hour information
It is expected that the completion of the assignments in addition to the attendance required for this course will take approximately 150 hours, therefore, this class meets the PLNU credit hour policy for a 3-unit class.

Instructors and contact information

Dr. Kris Koudelka
Associate Professor of Biology
Rohr Science Trailer, 849-2979
kriskoudelka@pointloma.edu

Dr. Dawne Page
Professor and Chair of Biology
Rohr Science 102B, 849-2204
dapage@pointloma.edu

Class sessions and attendance
Monday - Thursday from 1:00 pm- 5:30 pm.
Class attendance will be kept and the school's policy will be enforced as outlined in the university catalog. ***Attendance at all labs is required, unless you have a doctor's note excusing you.***

Required Text
There will be a reader that accompanies this course.

Spiritual Care
PLNU strives to be a place where you grow as a whole person. To this end we provide resources for our graduate students to encounter God and grow in their Christian faith. At the Mission Valley campus we have an onsite chaplain, Rev. Nancy Pitts who is available. If students have questions, a desire to meet with the chaplain, or prayer requests send a message to: gradchaplainmissionvalley@pointloma.edu
Additional resources for your Christian faith journey can be found here:
http://www.pointloma.edu/experience/faith/graduate-student-spiritual-life

Assignments and grading

Grading scale: A 90% B 80% C 70% D 60% F 50%

Final course grades will be recorded with – added to the lowest 2% and + added to the highest 2% within each range. For example, 91% = A- and 88% = B+

Grades will be based on 3 laboratory presentation (30%), a take-home exam (40%), and class assignments (30%). The exam will be passed out on the last day of class. It must be received as a Microsoft Word document to dapage@pointloma.edu and kriskoudelka@pointloma.edu by 8:00 a.m. on Monday, July 31. There will be a 10% penalty for each day late.

Graduate and Professional Studies Syllabus Notification Page

ACADEMIC HONESTY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.

ACADEMIC ACCOMMODATIONS

If you have a diagnosed disability, please contact Jean Moncada in the Center for Student Success (CSS) within the first two weeks of class to demonstrate need and to register for accommodation by phone at (619) 563-2849 or by e-mail at jmoncada@pointloma.edu. Ask your academic advisor or program director for any additional accommodation information.

ATTENDANCE AND PARTICIPATION

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work, including participation. See Academic Policies in the Graduate and Professional Studies Academic Catalog.

Date	Topic*	Homework*
WEEK 1		
July 10	Project Introduction	
	Genetic Code Review	
	Plasmid Biology, PCR Basics, Restriction Enzyme Basics	
July 11	Lab: Primer Design	
July 12	Molecular Biology Review	MoBio Homework1
	Present: Primer Design	
July 13	Lab: Set up PCR	MoBio Homework2 Case Study Homework1
	Case Study, Part I	
	Cancer Genetics	
WEEK 2		
July 17	Gel Theory	Cancer Homework
	Lab: Gels on PCR Products	
	Lab: Clean PCR Products	
	DNA Replication	
July 18	Lab: Digest PCR Products	Case Study Homework2
	Lab: Ligation	
	Case Study, Part II	
	DNA Repair	
July 19	Horizontal Transfer	Case Study Homework3
	Lab: Transformation	
	Case Study, Part III	
	Chimera	
July 20	Lab: Pick Cultures	Lab Homework
	Chimera Extension	
	Encode	
	Present: PCR Results	

Date	Topic	Homework
WEEK 3		
July 24	Chemistry of Plasmid Purification	Chimera Homework
	Lab: Purify Plasmid, Digest, Run on Gel	
July 25	Lab: Grow and Induce	
	Induction Theory	
	Chromatography Theory	
	Present Final Plasmid	
July 26	Lab: Purification and Chromatography	Induction/Protein Purification Homework
July 27	SDS-PAGE Theory	
	Lab: SDS-PAGE & Stain	

* Please note the timing of topics and exact homework assignments is approximate and should be viewed as tentative. We'll want to tweak this depending upon how class proceeds.