



Biology Department ☼

**Bio 3080 Molecular Biology** ☼

Lecture is 3 units, and Lab is 1 unit ☼

*Spring 2024* ☼

**Meeting days/times:** ☼

**Section 1: MWF 12:15-1:10PM**

**Section 2: MWF 1:30-2:25PM**

**Sections 3: MWF 11:00-11:55AM**

**Meeting location: Taylor 313** ☼

**Final Exam:** ☼

**Section 1: M 10:30AM-1PM**

**Section 2: M 1:30-4PM**

**Sections 3: F 10:30AM-1PM**

INFORMATION	SPECIFICS FOR THE COURSE
<b>Instructor title and name:</b>	Kristopher Koudelka, Ph.D.
<b>Phone:</b>	619-849-2979
<b>Email:</b>	kriskoudelka@pointloma.edu
<b>Office location and hours:</b>	<p><u>Office:</u> Rohr Science 122  <u>Scheduled office hours:</u> Tues/Thurs 11AM-12PM  <i><b>Email me to set up an appointment. I love meeting with students and am happy to find a time that works for both of us, especially if the scheduled office hours do not work for you. Emailing me to set up an appointment will also ensure that I am not in another meeting at the time.</b></i></p>

**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 is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

## Course Description★

A study of the regulatory mechanisms that govern gene expression in eukaryotic and prokaryotic cells and their viruses. Alterations of normal eukaryotic genetic regulatory mechanisms resulting from the transformed (cancerous) state also are discussed. Laboratory includes practical experience with the methodologies of modern genetic engineering. Lecture and lab. Offered every year.

## Program and Course Learning Outcomes★

Students will be able to:

- 1) Understand and apply how the molecular structure of nucleic acids and proteins dictate function, the mechanism of each process that allows for genes to be expressed as proteins, and regulation of the Central Dogma.
- 2) Perturb any of the above processes, and correctly predict the outcome.
- 3) Develop specific skills, competencies, and points of view needed by professionals in molecular biology
  - a) Form experimental hypotheses and accurate predicted results prior to actual experimentation.
  - b) Utilize skills and techniques critical to experimentation in a molecular biology laboratory setting.
  - c) Create informative figures, using raw data, that leads a reader to accurate conclusions.

## Required Texts and Recommended Study Resources\*

**Title:** Molecular Biology: Structure and Dynamics of Genomes and Proteomes  
**ISBN:** 9780367678098 **Edition:** 2ND 23  
**Required:** REQUIRED

## Assessment and Grading★

Your grade for this course will be based on three distinct evaluation tools in class (exams, team based learn activities, and participation); and five distinct evaluation tools in lab (hypotheses and predicted results, figures, an experimental plan, a final presentation, and participation). Each is described in detail below.

### CLASS

**Exams (50% of final grade)** - There will three midterms and a final exam. Each exam will consist of true/false, multiple choice, and short answer questions. All of science is cumulative such that scientific

knowledge must build and expand upon previous knowledge. The same is true when learning science, you must remember and apply all that you have previously learned in order to completely understand and apply newer material. Although the focus of each midterm will be on recent material, each should be thought of as a cumulative exam. The final exam will be semi-cumulative, with about one-third to half of the points coming from the previous chapters and the rest from the most recent chapters.

**Team based learning activities (10% of final grade)** - Team based learning allows students to use and apply course concepts. Application of foundation knowledge is important to all sciences, and is a critical skill for every person regardless of field. We will have four team-based learning events this semester. Each event will consist of an individual pre-quiz, a group version of the same quiz, an additional activity, and a peer evaluation questionnaire. Points will be awarded for the individual quiz, for the group quiz, and for the peer questionnaire.

Individual pre-quizzes = x points (e.g. 4 points)

Group quizzes = 2x points (e.g. 8 points)

Peer evaluation questionnaire = 1.5x points (e.g. 6 points)

**Class participation (5% of final grade)** - I teach largely by a lecture/discussion style. I hope that everyone will participate in the discussion through asking and answering questions. Your general class participation includes discussion, attentiveness, iClicker participation, not abusing computer privileges or checking texts. I realize that this is a large class and therefore it is hard to directly participate all the time. Thus, I am requiring iClickers and will have questions throughout the course that you must answer by your iClicker. **I am looking for thought and participation, not whether or not you answered the question correctly. Everyone must have their own iClicker and it must be registered with your student ID number by the end of the first week.**

## LABORATORY

**Hypotheses and predicted results (5% of final grade)** – Forming testable hypotheses is a critical skill for every scientist. An equally important skill is extending these hypotheses to predicted results. Thinking about results and what they mean before actual experimentation is an important transition in scientific thinking. **Waiting until during or after the experiment is too late to consider the impact of your experiment!** Prior to specific labs students will turn in typed hypotheses, predicted results, and a brief sentence on what each result means. This should include both positive and negative experimental outcomes.

**Figures (10% of final grade)** – A picture is worth a thousand words. Properly formed figures should be able to stand alone and support your conclusion. Any reader should be able to look at a figure and clearly understand your experiment and analysis without additional text. Creation of such figures can take as long, or longer, than writing an actual report. Figure creation will be one of the centerpieces of the lab experience.

**Experimental Plan (4% of final grade)** – This lab sequence will include a group self-designed experiment. Significant planning, hypothesis formation, and predicted results are expected prior to starting experimentation. These plans will clearly layout: hypotheses, predicted results, and what each result means; reagents and instrumentation needed; and a clear procedure.

**Final presentation (13% of final grade)** – On the final day of lab students will present the results of their self-designed experiments to the rest of the class. These presentations will take place in the oral format and last 12-15 minutes, followed by 5 minutes of questions. Each presentation should cover hypotheses, predicted results, raw data, analysis, and conclusions.

**Lab participation (3% of final grade)** – Much of lab work is completed in teams in both industry and academia. Students must be active, contributing members of their team to earn all possible points.

### Approximate grade breakdown

A	93.33-100%	B	83.34-86.66%	C	73.34-76.66%	D	63.34-66.66%
A-	90-93.33%	B-	80-83.33%	C-	70-73.33%	D-	60-63.33%
B+	86.67-89.99%	C+	76.67-79.99%	D+	66.67-69.99%	F	0-59.99%

### Final Examination Policy⊕

Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted on the [Traditional Undergraduate Records: Final Exam Schedules](#) site. If you find yourself scheduled for three (3) or more final examinations on the same day, you are authorized to contact each professor to arrange a different time for one of those exams. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

### Incompletes and Late Assignments

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. **Late Policy:** 0-24 hours late = can achieve up to 75% of possible points; 24-48 hours late = can achieve up to 50% of possible points; and more than 48 hours late = will not be accepted.

Incompletes will only be assigned in extremely unusual circumstances.

### Spiritual Care\*

Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith.

If you have questions, a desire to meet with the chaplain or have prayer requests you can contact your professor or the [Office of Spiritual Life and Formation](#).

### **State Authorization** Ⓡ

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on [State Authorization](#) to view which states allow online (distance education) outside of California.

### **PLNU Copyright Policy** Ⓡ

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

### **PLNU Academic Honesty Policy** Ⓡ

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.

### **Artificial Intelligence (AI) Policy\***

You are allowed to use Artificial Intelligence (AI) tools (e.g, ChatGPT, iA Writer, Marmot, Botowski, Grammarly) to generate ideas, but you are not allowed to use AI tools to generate content (text, video, audio, images) that will end up in any work submitted to be graded for this course. If you have any doubts about using AI, please gain permission from the instructor.

### **PLNU Academic Accommodations Policy** Ⓡ

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center ([EAC@pointloma.edu](mailto:EAC@pointloma.edu) or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an

academic accommodation plan (“AP”) to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student’s responsibility to make the first contact with the EAC.

### **Language and Belonging\***

Point Loma Nazarene University faculty are committed to helping create a safe and hospitable learning environment for all students. As Christian scholars we are keenly aware of the power of language and believe in treating others with dignity. As such, it is important that our language be equitable, inclusive, and prejudice free. Inclusive/Bias-free language is the standard outlined by all major academic style guides, including MLA, APA, and Chicago, and it is the expected norm in university-level work. Good writing and speaking do not use unsubstantiated or irrelevant generalizations about personal qualities such as age, disability, economic class, ethnicity, marital status, parentage, political or religious beliefs, race, gender, sex, or sexual orientation. Inclusive language also avoids using stereotypes or terminology that demeans persons or groups based on age, disability, class, ethnicity, gender, race, language, or national origin. Respectful use of language is particularly important when referring to those outside of the religious and lifestyle commitments of those in the PLNU community. By working toward precision and clarity of language, we mark ourselves as serious and respectful scholars, and we model the Christ-like quality of hospitality.

You may report an incident(s) using the [Bias Incident Reporting Form](#).

### **Sexual Misconduct and Discrimination\***

In support of a safe learning environment, if you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that accommodations and resources are available through the Title IX Office at [pointloma.edu/Title-IX](http://pointloma.edu/Title-IX). Please be aware that under Title IX of the Education Amendments of 1972, faculty and staff are required to disclose information about such misconduct to the Title IX Office.

If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at [counselingservices@pointloma.edu](mailto:counselingservices@pointloma.edu) or find a list of campus pastors at [pointloma.edu/title-ix](http://pointloma.edu/title-ix).

## **PLNU Attendance and Participation Policy**⊕

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions, the faculty member will issue a written warning of de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university withdrawal date or, after that date, receive an “F” grade.

### **Loma Writing Center**

The Loma Writing Center exists to help all members of the PLNU community cultivate transferable writing skills to engage their academic, professional, personal, and spiritual communities. We work toward this goal by conducting one-on-one consultation sessions, supporting writing education across the PLNU community, and participating in ongoing writing center research.

Getting feedback from the Loma Writing Center while you’re in the process of working on an assignment is a great way to improve the quality of your writing and develop as a writer. You are encouraged to talk with a trained writing consultant about getting started on an assignment, organizing your ideas, finding and citing sources, revising, editing for grammar and polishing final drafts, and more. For information about how to make in-person or online appointments, see [Loma Writing Center webpage](#) or visit the Loma Writer Center on the first floor of the Ryan Library, room 221.