

# ADVANCED BIOCHEMISTRY

**PLNU Mission:** 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.

## Welcome to CHE/BIO 4050, Fall 2024:

Chemistry/Biology 4050 is an upper division course cross-listed from the Departments of Chemistry and Biology. This **3 unit course** runs concurrently with CHE/BIO4050L and is designed to teach the fundamental principles of the chemistry involved in biological processes with an emphasis on protein structure and how it relates to function. The beauty of biochemistry is that it offers fun and excitement for everyone.

### INSTRUCTOR

Dr. Ariane Jansma

Email: [ajansma@pointloma.edu](mailto:ajansma@pointloma.edu)

Voice Mail: 619-849-2623

[Meet Prof J Video](#)

### OFFICE HOURS

Office hours are held in the **Rohr Science, 3<sup>rd</sup> floor conference room (Access through the Office Suite, Room 330)** - [Click for a Map of PLNU Campus](#)

Tues: 9:30\* am – 11:00 am and 12:30 pm – 2:00 pm

Thurs: 12:30 pm – 2:00 pm

\*NOTE: I teach at the PA School from 8:00 - 9:00 am on Tuesday mornings so this start time might need to be flexible if my students have questions after class or if I need to swing through the Starbucks drive-thru on my way to main campus or if I can't find a place to park. Otherwise, I should be available by 9:30.

I have additional times available to meet individually, so please send me an email if you would like to set up an appointment.

### LECTURE SCHEDULE

Section 1: MWF	11:00 am – 11:55 am	RLC 104
Section 2: MWF	12:15 pm – 1:10 pm	RLC 101
Final Exam	Dec. 16, 4:30 pm	TBA

### LAB SCHEDULE

Lab Section 1: W	2:45 pm – 5:45 pm	ST 221
Lab Section 2: W	6:30 pm – 9:30 pm	ST 221
Lab Section 3: R	8:00 am – 11:00 am	ST 221

## REQUIRED SUPPLIES FOR CLASS

- **Biochemistry, Concepts and Connections:** by Appling (with access to Mastering Chemistry, **jansma44496**), (ISBN: 9780321839763) **REQUIRED**
- **PyMOL Software:** You will receive a tutorial the first week of class to help you install the student version of PyMOL (free) on your personal computer  
**REQUIRED**
- **Lap top computer:** We will be working in groups throughout the semester using the protein visualization software PyMOL. If this is not possible, please contact me and we will work out options.  
**REQUIRED**
- **Doing your own work:** Each assignment in this course has been carefully designed to prepare you for exams as well as your future work in biochemistry. While there are AI-based methods to assist in completing assignments, doing so will absolutely hurt your ability to be prepared for in-class exams and future work in biochemistry. Use YOUR voice (not someone else's)!  
**REQUIRED**
- **Sleep:** It is highly recommended that you have at least 8 hours of sleep per night to be successful in this class as well as your other classes.  
**STRONGLY RECOMMENDED**

## COURSE GOALS and LEARNING OBJECTIVES

At the end of the course, you will be able to:

- Recognize and reproduce the structures of the 20 amino acids
- Apply specific properties of these amino acids to protein folding and activity
- Identify and evaluate enzymatic active sites based on appropriate chemical reactivity
- Apply specific chemical reactions to the processes of metabolism and photosynthesis
- Recognize how and when cells must degrade or apoptose
- Outline defining mechanisms and lifecycles of several representative viruses

**Catalog Description:** LECTURE: Detailed analysis of protein and membrane structure. Includes quantitative approaches to the study of enzymes, catalytic mechanisms of enzymes, and a survey of the major metabolic pathways of carbohydrates, lipids, amino acids and nucleic acids. Course includes one three-hour laboratory each week. LAB: An inquiry-based laboratory that is a co-requisite for [CHE/BIO 4050](#). Letter graded.

## LECTURE EVALUATION

The activities described below will contribute to your total course grade according to the following:

- |                             |     |
|-----------------------------|-----|
| • Examinations (3).....     | 45% |
| • Homework Assignments..... | 15% |
| • Quizzes.....              | 15% |
| • Final Examination.....    | 25% |

## LECTURE EXAMINATIONS

Exams will be held during the lab sections. You may attend your assigned lab section or choose an alternative lab section to attend for the exam, based on what works best for your schedule. The classroom location will be announced prior to the exam.

## HOMEWORK ASSIGNMENTS

Homework will consist of a combination of assignments through Mastering Chemistry (**Course ID: jansma44496**) as well as additional homework assignments, all of which are found on Canvas. Please make sure you have access to Mastering Chemistry and can access the homework via Canvas within the first week of class.

## QUIZZES

This course will have quizzes posted to Canvas most Monday mornings covering material from the previous week. Canvas quizzes are meant to be completed individually, therefore notes and other resources are not allowed. These quizzes are specifically designed to prepare you for the exams and assess your understanding of the material. Additionally, we will have 2 in-person quizzes throughout the semester, covering amino acids and metabolism. Please use these quizzes as an additional resource for exam preparation.

## FINAL EXAMINATION

The final exam for this class will include a comprehensive multiple choice exam covering material from the entire semester. The questions are written in an ACS style in order to best prepare you for future standardized exams involving Biochemistry, such as the MCAT or Subject GRE.

## 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 Class 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.

## COURSE CREDIT HOUR INFORMATION

In the interest of providing sufficient time to accomplish the Course Learning Outcomes stated above, this class meets the PLNU credit hour policy for a 3 unit class delivered over 16 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework. For this course, students will spend an estimated 112 total hours meeting the course learning outcomes over 16 weeks. This is also a very individual plan so focus on the time required for you to be successful.

## GRADES

Letter grades will be assigned at the end of the course for both lecture and lab based on your percentage of total possible points, according to the following scale, which will not be adjusted:

	<b>A</b> 93 – 100%	<b>A-</b> 90 – 92.9%
<b>B+</b> 87 – 89.9 %	<b>B</b> 83 – 86.9 %	<b>B-</b> 80 – 82.9 %
<b>C+</b> 77 – 79.9 %	<b>C</b> 73 – 76.9 %	<b>C-</b> 70 – 72.9 %
<b>D+</b> 67 – 69.9 %	<b>D</b> 63 – 66.9 %	<b>D-</b> 60 – 62.9 %
<b>F</b> < 59.9 %		

## **CLASS ATTENDANCE AND ASSIGNMENTS**

We will spend time in class discussing the material and applying this information to questions which will be covered throughout the exams. It is in your best interest to attend class. Missed assignments can only be made up for full credit for excused absences and students are responsible for all assignments and material covered. Lab attendance is mandatory, unless excused by the lab coordinator (Dr. Jansma) with consent of the Lab Instructor.

## **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 drop date or, after that date, receive an "F" grade.

## **CONTENT WARNING**

I acknowledge that each of you comes to PLNU with your own unique life experiences. This contributes to the way you perceive various types of information. In CHE/BIO4050, all of the class content, including that which may be intellectually or emotionally challenging, has been intentionally curated to achieve the learning goals for this course. The decision to include such material is not taken lightly. These topics include the study of human disease, viral infection and biochemistry of opioid drugs. If you encounter a topic that is intellectually challenging for you, it can manifest in feelings of discomfort and upset. In response, I encourage you to come talk to me or your friends or family about it. Class topics are discussed for the sole purpose of expanding your intellectual engagement in the area of biochemistry and I will support you throughout your learning in this course.

## **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 RECORDING NOTIFICATION**

In order to enhance the learning experience, please be advised that this course may be recorded by the professor for educational purposes, and access to these recordings will be limited to enrolled students and authorized personnel.

Note that all recordings are subject to copyright protection. Any unauthorized distribution or publication of these recordings without written approval from the University (refer to the Dean) is strictly prohibited.

## **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. For all student appeals, faculty and students should follow the procedures outlined 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 not allowed to use Artificial Intelligence (AI) tools (e.g., ChatGPT, Gemini Pro 1.5, GrammarlyGo, Perplexity, etc) to generate content (text of any kind, 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 in accordance with the Americans with Disabilities Act (ADA). Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will work with the student to create an Accommodation Plan (AP) that outlines allowed accommodations. The EAC makes accommodations available to professors at the student's request.

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. Accommodations are not retroactive so clarifying with the professor at the outset is one of the best ways to promote positive academic outcomes.

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. Students cannot assume that because they had accommodations in the past, their eligibility at PLNU is automatic. All determinations at PLNU must go through the EAC process. This is to protect the privacy of students with disabilities who may not want to disclose this information and are not asking for any special accommodations.

## 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.

If you (or someone you know) have experienced a bias incident regarding language, you can find more information on reporting and resources at [www.pointloma.edu/bias](http://www.pointloma.edu/bias).

## 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).

If you (or someone you know) have experienced other forms of discrimination or bias, you can find more information on reporting and resources at [www.pointloma.edu/bias](http://www.pointloma.edu/bias)

## PLNU COURSE MODALITY DEFINITIONS

**Online Courses:** These are courses with class meetings where all instruction and interaction is fully online.

**Synchronous Courses:** At least one class meeting takes place at a designated time.

**Asynchronous Courses:** All class meetings are asynchronous.

**Hybrid Courses:** These are courses with class meetings that take place both in the classroom and online synchronously and/or asynchronously.

**In-Person Courses:** These are courses that meet in person with the instructor and students in a physical classroom setting. With approval by the area dean, this may include up to 25% of qualified class interactions through a Learning Management System (such as Canvas).

## **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.

Appointment Calendar: <https://plnu.mywconline.com/>

Website: <https://www.pointloma.edu/centers-institutes/loma-writing-center>

Email: [writingcenter@pointloma.edu](mailto:writingcenter@pointloma.edu)

## **COURSE SCHEDULE**

The Schedule for this course is included as a separate document so please refer to CHE/BIO4050 Schedule available on our Canvas site for details.