

ADVANCED BIOCHEMISTRY

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.

Welcome to CHE/BIO 4050, Fall 2022:

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

Voice Mail: 619-849-2623

[Meet Prof J Video](#)

OFFICE HOURS

All office hours are held in the **Rohr Science, 3rd floor conference room**

Mon, Wed, Fri: 7:30 am – 8:30 am

Tues: 9:30 am – 11:30 am and 1:30 pm – 3:00 pm

Thurs: 11:00 am – 12:00 pm

LECTURE SCHEDULE

| | | |
|----------------|---------------------|-------|
| Section 1: MWF | 8:30 am – 9:25 am | LA102 |
| Section 2: MWF | 11:00 am – 11:55 am | LA102 |
| Final Exam | Dec. 15, 4:30 pm | TBA |

LAB SCHEDULE

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

REQUIRED TEXT BOOK and RECOMMENDED SUPPLIES

- **Biochemistry, Concepts and Connections:** by Appling (with access to Mastering Chemistry, **jansma15838**), (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.
REQUIRED
- **Sleep:** It is highly recommended that you have at least 8 hours of sleep per night in order 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: jansma15838**) as well as assignments posted to Canvas and details of each assignment will be given as necessary. Please make sure you have access to Mastering Chemistry within the first week of class.

QUIZZES

This course will have quizzes posted to Canvas each Monday covering material from the previous week. Notes and other resources are not allowed during Canvas Quizzes and they are meant to be completed individually. These quizzes are specifically designed to prepare you for the exams and assess your understanding of the material. Often you will have multiple chances to select the correct answer and your highest score will be counted. Please use this as a resource for studying.

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:

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

CLASS ATTENDANCE AND ASSIGNMENTS

History has shown that regular attendance is necessary for success in this course. We will spend time in class discussing the material and applying this information to questions which will be covered in the exams. It is definitely 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 (Jansma).

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.

SPIRITUAL CARE

PLNU strives to be a place where students 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 if you have prayer requests, you can contact the [Office of Student 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

Use of Artificial Intelligence (AI) tools (e.g, ChatGPT, iA Writer, Marmot, Botowski) is not permitted, and use of these tools will be treated as plagiarism. This will also hurt you in terms of exam preparedness so doing your own work will only help you.

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 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.

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. 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 or find a list of campus pastors at pointloma.edu/title-ix.

COURSE SCHEDULE

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