

ADVANCED BIOCHEMISTRY LABORATORY

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 and 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 4050L, Fall 2020:

Chemistry/Biology 4050L is an upper division laboratory course cross-listed from the Departments of Chemistry and Biology. This 1 unit course is meant to run concurrently with CHE/BIO4050 lecture and is designed to provide practical applications to understand the fundamental principles of the chemistry involved in biological processes. This semester will involve one project focusing specifically on developing skills in computational tools in order to evaluate the structure and function of the enzyme Beta-Galactosidase. I am very excited to work with you in order to better understand this system as well as practical tools available for analysis.

INSTRUCTORS

Ariane Jansma, Ph.D. (Course Coordinator)

Voice Mail: 619-849-2623

Email: ajansma@pointloma.edu

Introduction to lab: <https://youtu.be/sxd1V9pgsNM>

Kathy Pickham, Ph.D.

Email: kpickham@pointloma.edu

Course Website: <https://canvas.pointloma.edu/>

OFFICE HOURS via ZOOM (Additional Zoom details on Canvas)

Tuesday, Thursday, and Friday 9:00 am – 10:00 am:

<https://pointloma.zoom.us/j/94025648883>

Coffee with Prof J (Additional Zoom details on Canvas)

Monday and Wednesday 8:00 – 8:30 am:

<https://pointloma.zoom.us/j/96940100203>

LAB SCHEDULE

Weekly projects will be posted to canvas each Monday and will be due the following Monday by 11:59 pm. These projects will consist of an overview document as well as any necessary instructional files or videos. There will be Quick Write assignments due each week with one final report due by the end of the semester.

LEARNING MATERIALS

- **Computer**, the software applications will require the use of a laptop or desktop computer. Software applications will be made available to you as necessary.

COURSE LEARNING OUTCOMES

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

- Recognize the amino acid residues in the active site of enzyme beta-galactosidase
- Apply these amino acids to the specific mechanism necessary for enzyme function
- Identify and align protein sequences from various sources
- Utilize the software PyMOL in order to generate a point mutation
- Analyze ligand binding using an Open Source docking program
- Predict secondary structural elements utilizing an open source prediction tool
- Depict and represent data in a report format

Catalog Description: LAB: An inquiry-based laboratory that is a co-requisite for [CHE/BIO 4050](#). Letter graded. [CHE/BIO4050](#): 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.

EVALUATION

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

- Weekly Assignments..... 50%
- Participation on Discussion Board..... 10%
- Draft submissions..... 15%
- Final Lab Report..... 25%

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:

| | | |
|-----------------------|----------------------|-----------------------|
| | 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 % | | |

WEEKLY ASSIGNMENTS

Assignments will be posted to Canvas each Monday morning by 8:00. They will be due the following Monday by 11:59 pm. These assignments will vary week to week, but will include an overview of the project itself, instructional documents or videos, as well as specific directions for that week's Quick Write assignment and the topic for the Discussion Board.

FINAL LAB REPORT

There will be a final lab report submitted at the end of the semester detailing the work with Beta-Galactosidase. This report will be written in the style of a research paper and will include an Abstract, Introduction, Methods, and Results/Discussion. There will be opportunities throughout the semester to submit portions of rough drafts for comments and constructive feedback.

ATTENDANCE

ASYNCHRONOUS ATTENDANCE/PARTICIPATION: The material for the week will be made available by Monday morning at 8:00. A day of attendance in asynchronous content is determined as contributing a substantive note, assignment, discussion, or submission by the posted due date, when applicable. Failure to meet these standards will result in an absence for that day. For this lab course, participation in each weekly project will be evaluated through the Quick Write assignments, Discussion board topics and any additional activities, which will count as your attendance and participation for that week. Late submissions will not be accepted without a valid excuse.

PLNU ATTENDANCE POLICY: 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 the appropriate grade for their work and participation. In some courses, a portion of the credit hour content will be delivered **asynchronously** and attendance will be determined by submitting the assignments by the posted due dates. See [Academic Policies](#) in the Undergraduate Academic Catalog. If absences exceed these limits but are due to university excused health issues, an exception will be granted.

ADDITIONAL PLNU INFORMATION

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 students have questions, a desire to meet with the chaplain or have prayer requests you can contact the [Office of Spiritual Development](#).

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.

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. Incompletes will only be assigned in extremely unusual circumstances.

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.

PLNU ACADEMIC ACCOMMODATIONS POLICY

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center (DRC@pointloma.edu or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses. If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

USE OF TECHNOLOGY

In order to be successful in the online environment, you'll need to meet the minimum technology and system requirements; please refer to the [Technology and System Requirements](#) information. Additionally, students are required to have headphone speakers compatible with their computer available to use. If a student is in need of technological resources please contact student-tech-request@pointloma.edu. Problems with technology do not relieve you of the responsibility of participating, turning in your assignments, or completing your class work.

COURSE SCHEDULE

Given the hybrid and online modalities being used in the 2020-2021 academic year, the content of the course schedule and assignments will be posted in Canvas as its own document.