

# 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 2021:

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 both biochemical and computational tools in order to evaluate the structure and function of the enzyme Beta-Galactosidase through site-directed mutagenesis.

## INSTRUCTORS

Ariane Jansma, Ph.D. (Course Coordinator)

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Leah Rowland, Ph.D.

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Click [here](#) for a video introduction to lab

## LAB SCHEDULE (Week-by-Week Schedule available on Canvas)

Lab Section 1: W	4:45 pm – 7:45 pm	ST 221
Lab Section 2: R	8:00 am – 11:00 am	ST 221
Lab Section 3: R	1:30 pm – 4:30 pm	ST 221

## LECTURE SCHEDULE

Section 1: MWF	11:00 am – 11:55 am	Taylor 312
Section 2: MWF	12:15 pm – 1:10 pm	Taylor 312

## OFFICE HOURS

Office hours will be conducted either hybrid or through zoom

Monday: 1:30 pm – 2:30 pm <https://pointloma.zoom.us/j/92167588783>

Tuesday: 12:00 pm – 1:30 pm <https://pointloma.zoom.us/j/98238298763>

Thursday: 11:00 am – 12:00 pm Sator 221 **or** <https://pointloma.zoom.us/j/95794209916>

## LEARNING MATERIALS

- **Computer:** We will be using PyMOL viewing software and keeping electronic notebooks so you will need your laptop for most lab sessions.
- **Evernote:** Notebooks will be electronic using the free version of Evernote (Evernote Basic): <https://evernote.com/>

## 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
- Utilize the software PyMOL in order to generate a point mutation
- Construct mutant protein using recombinant expression techniques
- Execute assay to test functionality of mutant protein compared to WT
- 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.

## EVALUATION

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

- Attendance and Participation..... 40%
- Writing Assignments..... 20%
- EverNote e-notebook..... 15%
- Final Lab Report..... 25%

## ATTENDANCE

**SYNCHRONOUS and ASYNCHRONOUS ATTENDANCE/PARTICIPATION:** Your active participation each week is a significant portion of your grade in lab. Synchronous participation includes being present on time and contributing to the lab project for that week. During the weeks when lab is asynchronous, attendance and participation will be measured through completion of the assignments given for those specific weeks. Illness or participation in PLNU sponsored events are valid reasons for missing lab. If you need to miss lab, please discuss this with your instructor as quickly as possible, preferably in advance of the lab.

**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.

## **WRITING ASSIGNMENTS**

There will be several writing assignments throughout the semester which include: Quick Writes, Mutagenesis Proposal and a draft of your report Introduction. These assignments will be due throughout the semester and are indicated on the lab schedule.

## **ELECTRONIC NOTEBOOK**

The web based software Evernote will be used for electronic lab notebooks this semester. Evernote basic is freely available and can be accessed from any browser. You will share your notebook with your instructor and TA so that they can evaluate. Your notebook will be graded three times during the semester as indicated on the Lab Schedule.

## **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 and Abstract, Introduction, Methods, and Results/Discussion. There will be opportunities throughout the semester to submit drafts for comments and constructive feedback.

## **GRADE ASSIGNMENTS**

Letter grades will be assigned at the end of the course for lab based on your percentage of total possible points, according to the following scale:

	<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 %		

## **INCOMPLETES AND LATE ASSIGNMENTS**

All assignments are to be submitted/turned in by their due dates—including assignments posted in Canvas. Late work will not be accepted without a valid reason. If you need to submit late work, please discuss with your lab instructor. Incompletes will only be assigned in extremely unusual circumstances.

## **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.

## **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 ACCOMMODATION**

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.

## **COURSE SCHEDULE**

The content of the course schedule and assignments is posted in Canvas as its own document.