BIBC 103 Biochemical Techniques
Winter 2021   Course Syllabus

Instructor: Lara Soowal, Ph.D.
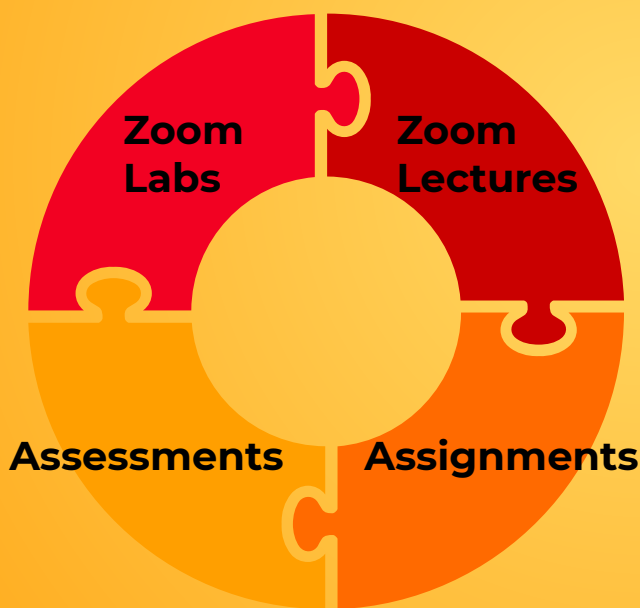Email: lsoowal@ucsd.edu

Instructional Assistants:
Vladimir Ermakov
vermakov@ucsd.edu
Cindy Lu
cvlu@ucsd.edu

Class Times:

Tuesdays and Thursdays 9:30 lecture, then we will take a short break before starting lab. Most days, we should be done by 1:00.

The parts of our class:

Zoom Lecture: These will be synchronous (presented live). Attendance is not mandatory, but is highly encouraged. Use the Zoom LTI PRO link on our Canvas page. Lectures will be recorded to allow review.

Zoom Labs: These will be synchronous, and attendance is mandatory. You will spend some of the time as a whole class, and some of the time working in a breakout room with your lab partners. Your enthusiastic participation is critical to your success. Labs are not recorded.

Assessments: There will be a 5 quizzes (time and format TBD), one for each of our learning modules.

Assignments: This refers to the work that you will do both in and out of lab, such as lab reports, data analysis, and presentations. Some assignments will be individual, and some will be completed with your lab partners.

What You'll Need:

- An internet connection and device to log on to Zoom meetings through Canvas
- Camera and microphone, the better to see and hear you with, my dears. Your faces and voices are mandatory in lab.
- The BIBC 103 lab manual (available through UCSD bookstore)
- Patience, good humor, and more patience (please?)

Course Objectives:
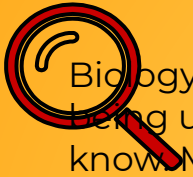
Biology is not just a series of accepted facts. Our knowledge is constantly being updated by new discoveries, and by challenging what we think we know. Memorizing a set of facts is not the way to understand biology. It is as important to understand HOW we make biological discoveries (the process) as it is to understand what those discoveries are (the facts).

This course is designed to develop the skills needed to interpret data from experiments in order to answer questions about biological systems, and to design experiments to ask new questions. You will be introduced to experimental methods used in biochemistry and molecular biology, with an emphasis on those techniques used to study proteins. The laboratory work will consist of two big multi-week projects and some shorter side projects. The lab work will emphasize the analytical and quantitative reasoning skills that are essential to work independently in a biochemistry lab.

Course Policies:

Attendance on Zoom at each lab session is mandatory. An unexcused absence will result in 10 points being deducted. If you know that you need to miss a lab session, discuss this with the instructor (not the IA, they are not authorized to give you permission) to see if it will be possible to make up the lab session or excuse you from the lab with no consequences. Please bring this to the instructor's attention as soon as you know that it will be an issue. **Only the instructor can excuse an absence. Two unexcused absences will result in the student failing the course.**

Regrades for written work will be handled on a case-by-case basis. Discuss your concerns with your IA, and if you are still not satisfied, submit the report to me within 1 week of receiving the graded report. I will regrade the entire report, and record that new score.

Late work will not be accepted for lab activities (that are mostly completed during lab time). Late assignments will be will be subject to a 10% penalty per 24-hr period.

Course Organization (The Modules):

- **Module 1:** Quantifying Concentration of Solutions; Spectrophotometry (side project/lab introduction)
- **Module 2:** Electrophoresis and SDS-PAGE (side project)
- **Module 3:** Purification of lactate dehydrogenase (LDH) (multi-week project)
- **Module 4:** Analysis of fibroblast growth factor (FGF) signaling in NIH 3T3 cells (multi-week project)
- **Module 5:** Bioinformatics, protein structure, protein crystallography

Class Schedule (Tentative):
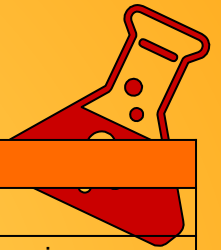
Week	Day	Activity
1	1/5	Organize groups; Module 1: Lab 1 part E calculations
	1/7	Module 2: **Live demo SDS-PAGE sample prep**; Calculations for preparing electrophoresis samples (Lab 2 part C, table for step 2)
2	1/12	Module 2: Detemine LDH isozymes from agarose gel electrophoresis
	1/14	Module 5: Bioinformatics Lab 19 part A
3	1/19	Module 5: **Live demo hanging drop preparation**; Prepare crystals round 1 (Lab 18 part C)
	1/21	Module 3: **Live demo Lab 3**
4	1/26	Module 3: **Live demo size exclusion chromatography**
	1/28	Module 3: Anayze LDH enzyme activity and Bradford assay data; prepare LDH Purification table
5	2/2	Module 3: Work on LDH purification table analysis
	2/4	Module 5: Examine crystals round 1; prepare crystals round 2
6	2/9	Module 4: Intepret data from Lab 9B part B; come up with experimental questions
	2/11	Module 4: Form hypothesis based on data; predict possible outcomes; design Western blot and ELISA experiments to test
7	2/16	Module 4: Calculations for Western blot samples; receive Western blot data; interpret
	2/18	Module 4: Receive ELISA data; interpret
8	2/23	Module 5: Bioinformatics Lab 19 part C
	2/25	Module 5: Examine crystals round 2
9	3/2	Module 5: Bioinformatics Lab 19 part D
	3/4	Module 4: work on proposal presentations
10	3/9	Module 4: group presentations
	3/11	Module 4: group presentations

Grade Determination

Available Points:

Activity	Value
Quizzes	350
Lab Activities	100
LDH Purification Table	150
FGF Signaling Lab Report	200
FGF Research Proposal Group Presentation	100
Bioinformatics Module	100
TOTAL POINTS	**1000**

Letter Grade Breakdown:

(Cutoff values may be lowered at instructor's discretion.)

910-1000	A	790-799	C+
900-909	A-	705-789	C
890-899	B+	695-704	C-
810-889	B	600-694	D
800-809	B-	0-599	F

⚠️ Academic Integrity:

With the exception of the group presentation and lab activities, all work in this course (all quizzes and written assignments) must be completed on your own, original work. Do not use old lab reports or share your work with any current or future students. During the quizzes, you may use your lab manual and any notes you have taken, but you may not communicate with other students or use the internet.

Assignments 1-3 will be submitted through Canvas, and are due by the end of the day (11:59 PM Pacific time) on the due date. Ten points will be deducted for each day that the lab report is late.

 Students agree that by taking this course all required papers will be subject to review for textual similarity by Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin service is subject to the terms of use agreement posted on the Turnitin site.