BILD4- Introductory Biology Lab   Spring 2024 (4/2/24-6/14/24)
Instructor: Dr. Stacy Ochoa **Email:** stochoa@ucsd.edu
Office Hours: Mondays 12:30-1:30pm HSS 8009 or by appointment

Welcome to BILD 4! In this course, we aim to develop an understanding for research in the biological sciences through laboratory experiments. To do so, we will work collaboratively in teams to collect, analyze and present original data while learning the foundational biological concepts and laboratory skills. We want to create a collaborative learning environment where we can all participate and create a shared understanding of the course material to accomplish the following learning goals.

Learning goals
- Collaborate with one another to learn foundational biological concepts and laboratory skills
- Apply knowledge of biology concepts and techniques to plan and troubleshoot experiments
- Engage in research and learn to construct scientific arguments based on evidence and reasoning
- Find, read and evaluate primary literature
- Develop and present research proposals in a conference setting
- Learn about research opportunities and other resources on campus

Course Information
This course is fully in-person. Please be on time for lectures and laboratory sessions especially as instructional assistants go over the experiments at the beginning of each session. Course materials, announcements, and other important details will be available on CANVAS (http://canvas.ucsd.edu/). Please check CANVAS and your @ucsd email regularly for updates and relevant information. Whenever possible, classes will be recorded (http://podcast.ucsd.edu/) and made available online as a resource. However, classes will be interactive. Therefore, podcasts are provided as for the purpose of review and should not be used solely to substitute for active engagement in classes.

Lecture:

Section	Day	Time	Room
All	T	5pm – 6:20pm	PCYNH 109

Lab Meeting:

Section	Day	Time	Room	IA	IA Email
A01	W	9am – 11:50pm	Tata 2301	Max Gruber	mgruber@ucsd.edu
A02	W	9am – 11:50pm	Tata 2302	Leanne Dugan	ldugan@ucsd.edu
A03	W	9am – 11:50pm	Tata 2303	Rae Metry	rmetry@ucsd.edu
A04	W	9am – 11:50pm	Tata 2304	Deevya Raman	dsraman@ucsd.edu
A05	F	9am – 11:50pm	Tata 2301	Max Gruber	mgruber@ucsd.edu
A06	F	9am – 11:50pm	Tata 2302	Leanne Dugan	ldugan@ucsd.edu
A07	F	9am – 11:50pm	Tata 2303	Rae Metry	rmetry@ucsd.edu
A08	F	9am – 11:50pm	Tata 2304	Deevya Raman	dsraman@ucsd.edu

Required Materials:
Assigned reading for this course will be from various sources including primary literature papers and will be posted on CANVAS. **The BILD4 lab manual will need to be purchased from the bookstore**. **You'll also need a knee-length lab coat, safety classes and access to CANVAS**. Lab coats and safety glasses can be purchased at the campus bookstore, Amazon or Target. iClicker cloud will be used (no physical clickers, questions can be answered on any mobile device or laptop)

Laboratory Safety
Safety precautions are crucial in the laboratory setting. **Biology lab safety training and assessment must be completed by the beginning of the first laboratory meeting.** Students will not be allowed to participate in any laboratory section without completing this online training and assessment. In the lab, you must wear proper lab attire at all times! This includes close-toes shoes, socks, pants with no holes, and hair tied back. No skin should be exposed from the waist down. If you do not have proper lab attire, you will be sent home to change.

Course schedule
Below is a tentative course schedule. More specific details for each week will be provided on Canvas and in class. We may also adjust the schedule as necessary, while still focusing on learning the important concepts and laboratory skills intended for this course.

Week	Tuesday Lecture	Wednesday Lab (sections A01-A04) Friday Lab (sections A05-A08)	Assignments/Quizzes
1 April 2-5	Class introduction, finding sources, microbiomes	Ice breaker, make logo, lab intro, **SL**-literature search exercise, **FW, FW1**-field trip to reserve to collect soil	
2 April 9-12	Pipetting, statistics, excel	**BB1**- pipetting, **BB2**- writing assignment stats	Writing Assignment #1 **Due Sunday**
3 April 16-19	Soil properties, pH, dot plot, invasive plants	**SP1**- measure soil pH **GB1**- save soil aliquots, start group project ideas, **SP2**- set up moisture, **FB1** Part 4 step 1 only	Lab Practical #1- in lab Quiz #1 **Due Sunday**
4 April 23-26	Plating, identifying bacterial species, replicates, controls	**TB1**- plate soil samples, **SP3**- moisture part 2	Writing Assignment #2 **Due Sunday**
5 April 30 May 1-3	Colony morphology, ecoplate setup	**TB2**- analyze plates, **FB1**- ecoplate setup	Quiz #2 **Due Sunday**
6 May 7-10	Graphing, ecoplate calculations, chi-square, functional biodiversity	**FB2, FB3**- ecoplate read and analysis continue project ideas	Lab practical #2- in lab Writing Assignment #3 **Due Sunday**

7 May 14-17	Sampling, DNA extraction, nanodrop, PCR	**GB2**- DNA extraction, **GB3**- nanodrop, run 16s PCR	Quiz #3 **Due Sunday**
8 May 21-24	Gel electrophoresis, clean-up	**GB4**- gel electrophoresis of PCR **GB5**-clean-up, finish group projects	Quiz #4 **Due Sunday**
9 May 28-31	IA talks	Work on poster	Lab Practical #3- in lab
10 June 4-7	Genetic biodiversity, IA talks,	Writing assignment 4	Writing Assignment #4- due in lab section
Finals Week	June 13, 7pm – 9pm: Poster Presentation Session		

Course Structure

For this course you will take an active role in the learning process. Rather than memorization, our approach will prioritize comprehending essential concepts and laboratory techniques as they relate to various examples. We will learn to draw conclusions based on logical reasoning and empirical evidence. Through classroom and laboratory sessions, we will build and apply our understanding, address difficult topics, and enhance our problem-solving and critical thinking abilities. Assignments involving data analysis and writing, as well as the research proposal and presentation, will encourage us to think critically about experiments and data.

We are in this together! If you have any concerns or issues, please don't hesitate to reach out to me for support. Together, we can create a supportive and inclusive learning environment where we can all thrive.

Assessments of Learning Outcomes

Lecture	Lecture Participation (10)	24 pts	2 Lowest grades dropped
	Quizzes (4)	75 pts	Lowest grade dropped
	Professionalism	4 pts	
Lab	Pre-Lab (9)	28 pts	2 lowest grades dropped
	Lab Participation (10)	20 pts	
	Lab Research Notebooks (10)	30 pts	
	Lab Practical (3)	30 pts	
	Writing Assignments (Individual./Group) (4)	100 pts	
	Final Poster Presentation	45 pts	
	Total Points	356 pts	

LECTURE PARTICIPATION

Active engagement and participation are critical to your success in this course. You are expected to participate in discussions and activities during lecture. Attendance is being physically present, while participation means fulfilling the necessary requirements. Actively participating means being mentally

involved which leads to learning, such as working cooperatively with team members, answering discussion questions, raising inquiries, etc. data. Participation will be taken using iClicker cloud (participate using mobile devices only, $15.99). We recommend that you attend as often as possible because this is an opportunity to learn and work with your peers. Participation is based on submitted answers not correctness. Important: when you sign up use your ucsd email address so that participation will sync with canvas! There is no make-up points for lecture participation, but the two lowest scores will be dropped.

QUIZZES
There will be 4 quizzes during the course through CANVAS (see course schedule). Quizzes will mainly focus on recently covered material but may have previous relevant material. **Quizzes will open on Friday by 12pm and will be due by Sunday at 11:59pm**. There will be no late or makeup quizzes, but the lowest quiz score will be dropped.

PROFESSIONALISM
The professionalism points are intended to engage everyone in considering the impact of their actions on their own learning and the learning of others in the course. Unprofessional interactions consume time yet have no meaningful benefits. Professionalism can be demonstrated through individual and community efforts. The individual component is to account for demonstrating maturity and professionalism. **By default, everyone is assumed to be professionally mature. Hence, this component is awarded at the beginning of the quarter**. During the quarter, based on observations by the IA team, which includes but is not limited to one-on-one interactions, electronic communication, and follow-up conversations on different correspondence, professionalism credit may be deducted.

Examples of <u>professional</u> interactions with meaningful benefits:
1. Developing deeper insight into course material, course concepts, biology, and/or society in general
2. **Working collaboratively** to improve in skill building and future opportunities
3. Learning conceptually and meaningfully why full credit was not awarded for an assignment
4. Clarifying course material that facilitates deeper learning
5. Reporting errors or problems in class or laboratory, assignments, or other course material in a professional manner
6. Carrying out procedures safely and paying attention to waste disposal in the laboratory
7. Turning assignments in on time, communicating effectively with the professor if a goal will not be met

Examples of <u>unprofessional</u> interactions that have no meaningful benefits:
1. Not contributing or contributing inequitably to teamwork in class, in section, or on team assignments
2. Harassing and/or bullying the instructional team or other students, either in person or online
3. Being disruptive to fellow students in class
4. Ignoring the directions or requests from the instructional team
5. Being late to lab or missing class without communicating with the professor
6. Turning assignments in late
7. Not turning assignments in

PRELAB
Please ensure that you complete the prelab on CANVAS by the due date before each lab session. The prelab may involve drawing out the procedure for the day's lab or answering conceptual questions. No late prelabs will be accepted however the lowest two grades will be dropped.

LAB NOTEBOOK
Your answers to lab notebook questions will be completed during lab as a pair and inputted into a Googledoc that will belong to your pair for the entire quarter. **The link to your pair's Lab Notebook can be found on CANVAS.** The lab notebook questions will be posted on CANVAS under the weekly modules. All entries should be completed by the end of the lab day (you should be able to complete them by the end of lab). Lab entries will be checked by your IA. Students must be present and participating for the full lab time in order to receive any lab entry points for that day.

LAB PARTICIPATION
You will receive points for showing up on-time, staying for the whole lab and being a proactive member of the group. This includes but is not limited to communicating with all group mates during lab, working as a unit and not dividing everything up or leaving anyone out. Communicating important information to your IA, following upon the agreed upon community norms, and not spending time doing outside class activities (homework, social media).

WRITING ASSIGNMENTS
There will be 4 writing assignments throughout the quarter. The assignments will focus on generating figures from data collected by all groups in each laboratory section and drawing conclusions that are supported by evidence and reasoning in scientific arguments. Some of the writing assignments will be done individually and some will be done as a pair.

LAB PRACTICALS
A lab practical is an assessment format commonly used in laboratory-based courses, in which students demonstrate their practical skills learned in the lab class. During each of the three lab practicals, students will be presented with a series of tasks where they are required to perform specific experiments, analyses, or observations. The lab practicals will be timed and conducted individually. They are an important component of evaluating student's overall understanding of the lab material.

POSTER PRESENTATION
This final project will be a research proposal written and presented in poster format collaboratively with your lab group. **The poster session will take place during the course final exam time**. Each group will identify a biological topic to study hypothetically based on concepts that we have learned and then propose experiments to investigate that topic using foundational concepts and laboratory skills learned in the course. Please see CANVAS throughout the quarter for more details.

Final course grades will be determined objectively based on participation/professionalism, activities, assignments, quizzes, and presentation. **While grades may currently be a primary focus, it's crucial to remember that as you choose your career or academic path, the skills, knowledge, motivation, and wisdom will be what helps you reach your goals. Focus on developing these skills in each of your classes, ultimately**

building a solid foundation of knowledge and expertise. The course will not be curved, and final grades will be rounded to nearest whole number. Grades will be determined by the percentage of points you earn based on the following tentative grading scales:

A+	> 98.0	B+	88.0	C+	78.0	D+	68.0	F	< 60.0
A	92.0	B	82.0	C	72.0	D	62.0		
A-	90.0	B-	80.0	C-	71.0	D-	60.0		

Course Policies
Attendance and Late Assignments:
Lecture and lab attendance is required and is essential to understanding the material and performing well in the course. Excused absences may be approved but must be communicated with by emailing Dr. Ochoa and must be done before the absence occurs (except in emergencies). If given an excused absence for lab student will be responsible for making up **a lab makeup assignment by 3 business days after the missed lab** – failure to do so will result in a missed lab notebook assignment. Additionally, if they missed a lab practical, they must **complete the lab practical in the next lab that they attend** (please reach out to your IA or Dr. Ochoa to coordinate this) – failure to do so will result in a missed lab practical.

Late assignments/quizzes/reports <u>are not accepted</u> unless there is a doctor's note, a prior request for accommodations, or existing accommodations. I have included dropping lowest lecture participation, quizzes and pre labs to accommodate for sickness and life. If a student is struggling, it is their responsibility to seek out help and let the professor know of their circumstances <u>before</u> assignments/quizzes are to take place. <u>Students cannot ask for accommodations retroactively</u> – this includes asking for an extension for work that has already been due. It is the responsibility of the student to: write due dates down in a calendar when they are announced, start on an assignment well in advance so last minute issues are not a problem, turn in assignments on time, manage their time accordingly, and communicate with the professor in a timely manner if goals will not be met. **Time-management and effective communication** are integral skills in any professional environment.

Add/drop deadlines: Deadlines are different for lab courses than lecture courses. Students who drop a biology lab class after the end of the **second-class meeting** will be assigned a "W" – so please make sure to drop the class **by the end of the first day** if you are planning to drop. Additional details: http://biology.ucsd.edu/go/ug-labs.

Regrading
If a grading error has been made, please submit a regrade request to Dr. Ochoa within one week of the assignments being returned. Explain or do a concise description for the request. Regrades are submitted with the understanding that the instructional team may: (1) regrade the entire assignment, and (2) compare the submitted paper to a copy of the original assignment. As a result, the overall grade may go up or down or remain the same after the regrade.

Group Work
A major goal of the course is to learn to collaborate with others. Unfortunately, despite best efforts and intentions, groups do not always function optimally. Dealing with these challenges is a natural part of the

learning experience. Everyone is expected to **contribute fully and equitably to group work** as part of the university learning community. If disputes occur over the relative contribution of individual members of the group, **please contact your IA and Dr. Ochoa immediately** so the issue can be resolved.

 University Policies and Resources

ACADEMIC INTEGRITY
Honesty is primarily the responsibility of each student. **Academic integrity applies to any assignment in the course, regardless of how many points an assignment is worth.** Website: https://academicintegrity.ucsd.edu/
The College considers cheating to be a voluntary act for which there may be a reason, but for which there is no acceptable excuse. It is important to understand that collaborative learning is considered cheating unless specifically allowed for by the professor. The term cheating includes but is not limited to plagiarism, receiving or knowingly supplying unauthorized information, using unauthorized material or sources, changing an answer after work has been graded and presenting it as improperly graded, illegally accessing confidential information through a computer, taking an examination for another student or having another student take an examination for you, and forging or altering grade documents.

If any act of academic dishonesty is observed, **the professor is required to report it.** The student will **automatically receive a zero** on that test or assignment (the grade received as a result of an academic integrity violation stays calculated into the student's GPA even if the student retakes the class). There will also be an AI Administrative Fee of $50 (posted to the student account), mandatory AI Training, at least one Disciplinary Action, and possibly other actions per the professional judgement of the Appropriate Administrative Authority (AAA). Discipline may include probation, suspension (from a Quarter to Two Years), or dismissal. Please do not risk your GPA and/or future career by cheating, if you are unsure ask, we are learning. .

USE OF ARTIFICIAL INTELLIGENCE (AI)
AI technology can be used for a variety of purposes and is neutral by nature, neither good nor bad. Its value hinges on how it's applied. We acknowledge AI's potential to both elevate and diminish the academic experience. While it's a powerful tool for the digital age and essential for our future, it **doesn't absolve us from upholding academic integrity** and opposing plagiarism. While you cannot use AI (such as ChatGPT) on quizzes, you can use it for other assignments in the course. However, you must **always cite the AI appropriately** according to how you use it.

Below is list of student resources.
- ***Office for Students with Disabilities (OSD) –*** (https://osd.ucsd.edu/) Assists students with documented disabilities (psychological, psychiatric, learning, attention, chronic health, physical, vision, hearing, brain injury) to provide accommodations in classrooms and labs. For example, if you think you may have test anxiety due to an underlying condition that interferes with your ability to learn, focus, or concentrate, OSD is a great resource. In many cases, students are entitled to assistance with test taking, such as extra time to complete a test, testing in a less distracting room or having questions read aloud. OSD's mission is to offer quality programs and services that empower students with disabilities

to access and engage in educational activities at UCSD. Please notify your instructor immediately if you require special health or disability accommodations.

- ***Counseling and Psychological Services (CAPS) –*** (https://wellness.ucsd.edu/CAPS/services/Pages/Appointments.aspx) This is an **amazing resource** staffed by **professional therapists**. If you are feeling overwhelmed by emotions or need help working through a problem, please make an appointment. For first-time appointments, you can now go directly to MyStudentChart.ucsd.edu and book an appointment online.

- ***Dean of Student Affairs****:* The Undergraduate Colleges are available to support students who experience difficulties and need assistance getting connected to and navigating resources. They essentially **coordinate support for students,** so the student is not overwhelmed. Examples include connecting students to appropriate resources such as academic advising and counseling, providing immediate connection to support services (Temporary Housing Protocol and/or Emergency Meal Assistance Program), contacting professors, etc. More info here: College Resources (ucsd.edu).
    - Contact information:
    - Revelle College: Sherry Mallory, slmallory@ucsd.edu
    - Muir College: Jason Thibodeaux, jjthibodeaux@ucsd.edu
    - Marshall College: Amber Vlasnik, avlasnik@ucsd.edu
    - Warren College: James C. Smith, jcs004@ucsd.edu
    - Roosevelt College: Mario Garibay, magaribay@ucsd.edu
    - Sixth College: Diane LeGree, dlegree@ucsd.edu
    - Seventh College: Josh Brimmeier, jbrimmeier@ucsd.edu
    - Eighth College: Sarah Gallenberg, sgallenberg@ucsd.edu

- ***Teaching + Learning Commons –*** (https://commons.ucsd.edu/students/academic%20support.html) Made up of six unique, but integrated hubs, The Teaching + Learning Commons provides comprehensive academic support for students. Includes tutoring, writing help, learning strategy workshops, and study groups.

- ***Triton Food Pantry –*** (https://basicneeds.ucsd.edu/food-security/pantry/index.html) Please **don't go hungry**! Triton Food Pantry is **free and available for any student.** The pantry has food staples such as oatmeal, canned soups, fresh produce, dry goods, and milk that students can access for **free** at Student Center A (next to The Hub) or Graduate Housing (a.k.a "OMS") on Miramar Street. For food pantry hours, please see the above website. In general, food items are assigned a point value and **any** registered student is able to pick up 15 points worth of food per week. There is no parental salary requirement or anything like that. The Triton Food Pantry also provides a range of services including care packages, emergency food relief, basic needs events, and various pop-up locations on campus.

- ***The Hub Basic Needs Center –*** (https://basicneeds.ucsd.edu/index.html) If you are facing challenges with access to adequate food, stable housing, or general resources, please complete this form so assistance can be provided: https://basicneeds.ucsd.edu/forms/basicneeds/index.html. The Basic Needs Center also provides free hygiene products on an emergency basis.

- ***The Writing and Critical Expression Hub –*** (http://commons.ucsd.edu/students/writing/index.html) provides support for undergraduates working on course papers, i.e., lab reports as well as other independent writing projects. Writing mentors can help at any stage of the writing process, from brainstorming to final polishing. The Writing and Critical Expression Hub offers one-on-one writing, tutoring by appointment, supportive and in-depth conversations about writing, help with every stage in the writing process, walk-in tutoring, and workshops on writing.

- ***The Office for the Prevention of Harassment & Discrimination (OPHD) –*** (https://ophd.ucsd.edu/) OPHD aids students, faculty, and staff regarding reports of bias, harassment, and discrimination. OPHD is the UC San Diego Title IX office. Title IX of the Education Amendments of 1972 is the federal law that prohibits sex discrimination in educational institutions that are recipients of federal funds. Students have the right to an educational environment that is free from harassment and discrimination. Students have options for **reporting incidents of sexual violence and sexual harassment**. Sexual violence includes sexual assault, dating violence, domestic violence, and stalking.

  - Information about reporting options may be obtained at OPHD at 858-534-8298, ophd@ucsd.edu, or http://ophd.ucsd.edu. Students may receive confidential assistance at CARE at the Sexual Assault Resource Center at 858-534-5793, sarc@ucsd.edu, or http://care.ucsd.edu , or Counseling and Psychological Services (CAPS) at 858-534-3755 or http://caps.ucsd.edu.

  - Students may feel more comfortable discussing their particular concern with a trusted employee. This may be a student affairs staff member, a faculty member, a department chair, or other university official. These individuals have an obligation to report incidents of sexual violence and sexual harassment to OPHD. This does not necessarily mean that a formal complaint will be filed. If you find yourself in an uncomfortable situation, **ask for help**. The university is committed to upholding policies regarding nondiscrimination, sexual violence, and sexual harassment.

- ***Student Organizations:*** feel more connected to your peers and campus community by joining a student club: https://studentorg.ucsd.edu/. Sort by category and find a club that works for you!

- ***Dine or Coffee with a Professor or Graduate Student*** :We also encourage you to take advantage of the Dine-With-a-Prof or the Coffee-With-a-Prof program in the colleges (https://students.ucsd.edu/academics/success/dine-with-a-prof.html). Undergraduate students may participate in the Dine-With-a-Prof program and the Coffee-With-a-Prof program. These can be used with any professor or graduate instructional assistant on campus.

- ***Joining a research lab:*** If you want to join a research lab on campus, you can! Labs will allow undergraduate students to perform certain tasks to assist with graduate student research. Some labs will even allow undergraduate students to conduct their own research. How do you find a lab you want to join? Use Real Portal (REAL Portal (ucsd.edu)), Handshake (Research Opportunities (ucsd.edu)), or the Undergraduate Research Hub (Undergraduate Research Hub (ucsd.edu)). You can even cold-email professors whose labs you are interested in joining. **You don't need prior research experience or even**

prior knowledge; you'll learn everything in the lab. Video: [Getting into Undergraduate Research @ UCSD - YouTube](#).

Diversity and equity statement
It is important for us to make sure that how we teach this course and how we accommodate different student needs reflects the differences of race, ability, sexual orientation, age, and gender identity that enrich our classroom experience and campus. If you have any concerns related to diversity and equity in the course, please contact the instructor. If you find yourself in an uncomfortable situation, ask for help. The university is committed to upholding policies regarding nondiscrimination, sexual violence, and sexual harassment.

Subject to change policy:
Due to unforeseen circumstances, minor aspects of this syllabus may change. These include changes to scheduling, grading values, and policy. It is the responsibility of the instructor and instructional assistants to announce changes with reasonable notice in multiple formats (e.g., lecture and CANVAS announcements, email, etc.). It is the responsibility of the student to make note of these changes and communicate with the instructor if you have questions or concerns about the changes.

TIPS FOR SUCCESS IN GENERAL BIOLOGY_____

- **Devote plenty of time to the course**. While we meets once per week, this does not mean that you can get away with devoting 1 hour and 15 minutes a week to the course. Complete the readings carefully and use the assignments as an assessment tool to see how well you understand the material and what still confuses you. Give yourself plenty of time to complete the assignments after labs and lectures. These assignments will focus more on critical thinking to reinforce concepts you read and watched lectures about.   Since you only meet with me once per week, you should expect to spend **at least** the equivalent of one class period working outside of class.

- **Participate actively.** Research shows that students that participate in active learning, such small group discussions and activities, learn the material more effectively and do better in the course overall.

- **Use the learning outcomes for each lecture as a study guide**. Each module a list of outcomes that you could be able to complete after completing all the components of the assignment. Assignments and exams are based directly from these outcomes.

- **Study a little bit each day**. While it's tempting to put off studying until an exam, this can make the material seem absolutely overwhelming. Via lectures and assignments, the course is designed to expose you to the material as often as possible. However, the best time to review the learning outcomes is , when the material is fresh. Reviewing the material early and often can also help assess if you are having problems with the material so that you can seek help ASAP.

- **Study in groups.** It can be more efficient and can help build confidence. The absolute best way to learn to is to have to explain the material to a friend. Quiz each other on the learning outcomes to find out what you actually know versus what you thought you knew before you had to explain it out loud.

- A**sk questions .** Chances are, if you don't understand a concept, someone in the course is also confused (which is most likely a reflection on my teaching ability and not necessarily your comprehension). Questions are strongly encouraged and can generate great discussions!

- **Ask questions during office hours.** This is not an inconvenience or imposition…we want to meet with you. The most successful students ask for help!