

UCSD BILD 4

Professor: **Dr. Ivonne González-Gamboa**

Lecture Schedule **Spring Quarter 2024**: 4/1/24 - 6/7/24

Welcome to BILD 4! This quarter, we will develop an understanding for research in the biological sciences through laboratory experiments. By working together in teams, we will collect and analyze original research data while also developing foundational biological concepts and laboratory skills. We want to create a collaborative learning environment where we can all actively participate and contribute to developing a shared understanding of the course material. 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, 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.

LEARNING OUTCOMES

- Work together to acquire fundamental knowledge of biological concepts and laboratory techniques.
- Participate in research and acquire the ability to create scientific arguments founded on evidence and reasoning.
- Create research proposals and present them in a conference environment.
- Gain knowledge about research prospects and other resources available on campus.

COURSE COMPONENTS

- Class: Learn biological concepts related to the laboratory research project
- Laboratory: Engage in a collaborative research project on soil microbiomes on campus
- Project: Develop and present research proposals on hypothetical projects
- Assessments: Demonstrate an understanding of course materials through different modes of evaluation

COURSE LOGISTICS

This course is fully in-person. Please be on time for laboratory sessions, as instructional assistants go over the experiments at the beginning of each session. The core learning components in this course are comprised of collaborative activities in class meetings and laboratory sections, in addition to independent and group work on studying and completing assignments. Course materials, announcements, and other important details will be available on CANVAS (<https://canvas.ucsd.edu/>). Please check CANVAS and your @ucsd email regularly for updates and relevant information.

Lecture:

Section	Day	Time	Room
All	M	6:30 pm – 7:50 pm	PCYNH 109

Lab:

Section	Day	Time	Room	IA
C01	T	1 pm – 3:50 pm	TATA 2301	Je Seung
C02	T	1 pm – 3:50 pm	TATA 2302	Sara
C03	T	1 pm – 3:50 pm	TATA 2303	Poorvi
C04	T	1 pm – 3:50 pm	TATA 2304	Benjamin
C05	Th	1 pm – 3:50 pm	TATA 2301	Je Seung
C06	Th	1 pm – 3:50 pm	TATA 2302	Sara
C07	Th	1 pm – 3:50 pm	TATA 2303	Poorvi
C08	Th	1 pm – 3:50 pm	TATA 2304	Benjamin

REACHING THE INSTRUCTIONAL TEAM

Professor: **Dr. Ivonne González-Gamboa**

Professor contact: igonzaiegamboa@ucsd.edu (Please write BILD 4 in the subject)

Student Hours: M, 5:00pm – 6:00pm, FAH 4009 and W, 10:30am–11:30am, Zoom (Link on CANVAS)

IA information

IA name	IA email
Je Seung An	j4an@ucsd.edu
Benjamin Lee	bel008@ucsd.edu
Poorvi Saini	psaini@ucsd.edu
Sara Herrera de la Mata	sherreradelamata@ucsd.edu

COURSE MATERIALS

Assigned readings for this course will be from various sources including primary literature papers and will be posted on Canvas. BILD 4 Lab manual. You'll also need a knee-length lab coat, safety glasses, and access to CANVAS. Lab coats and safety glasses can be purchased at the campus bookstore, Amazon, or Target. If you do not have access to a computer, please see "student resources" on CANVAS to request a loaner.

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.

Course calendar

A general outline for the course is provide below. 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	Dates	Lecture Mondays	Lab Tuesday C01-C04 or Thursday C05-C08
1	4/1 4/2 4/4	Class intro, finding sources, microbiomes	Ice breaker, lab intro, literature search exercise (SL), field trip to reserve (FW1) to collect soil.
2	4/8 4/9 4/11	Beginning basics: pipetting, introductory statistics, excel	Pipetting (BB1, BB2), WA 1 due Sunday 4/14.
3	4/15 4/16 4/18	Soil properties, pH, invasive plants	Lab practical #1 (pipetting). Measure soil pH (SP1), save soil aliquots (GB1), start group project ideas, set up moisture (SP2) FB1 Part 4 step 1 only. Quiz 1 due Sunday 4/21.
4	4/22 4/23 4/25	Functional biodiversity: plating, identifying bacterial species, replicates, controls	Plate soil samples (TB1), moisture part 2 (SP3), WA 2 due Sunday 4/28.
5	4/29 4/30 5/2	Functional biodiversity: colony morphology, ecoplate setup	Analyze plates (TB2), ecoplate setup (FB1), Quiz 2 due Sunday 5/5.
6	5/6 5/7 5/9	Functional biodiversity: graphing, ecoplate calculations, chi-square	Lab practical #2 (dilutions). Ecoplate read and analysis (FB2, FB3), continue project ideas. WA 3 due Sunday 5/12.
7	5/13 5/14 5/16	Genomic biodiversity: sampling, DNA extraction, nanodrop, PCR	DNA extraction (GB2), nanodrop, run 16s PCR (GB3). Extra-credit assignment due 5/19.
8	5/20 5/21 5/23	Genomic biodiversity: gel electrophoresis, clean-up	Gel electrophoresis of PCR (GB4), clean-up (GB5). Quiz 3 due on Sunday 3/10.
9	5/27 5/28 5/30	Holiday: No in-person lecture. Professional development resources	Lab practical #3 (PCR, nanodrop, gels). Work on posters. Posters due 6/2.
10	6/3 6/4 6/6	Scientific talks	WA 4 due in lab section, work on poster presentation.
Finals Week	6/12 W	Poster presentations 7-8:30 pm	

GRADING

BILD 4 has five grading components:

- Class contribution 30%
 - Lab - Pre-Labs: 7 pts
 - Lab - Attendance/Participation: 15 pts
 - Lab - Notebooks: 13.5 pts
 - Lecture - Participation forms: 4.5 pts
 - Lecture - Piazza discussions: 4.5 pts
 - Lecture - Scientific talks engagement: 2 pts
- Lab practicals 6%
- Writing assignments 30%
- Quizzes 16%
- Final presentation 15%
- Professionalism 3%

These six grading components add up to 100%, and final grades will be determined based on percentages out of 100%. There is a 2% extra credit assignment that will be posted on CANVAS. BILD 4 is not graded on a curve. Thus, the ability to do well in this course is not dependent on others doing poorly.

A+	96-100%	B+	87-90%	C+	77-80%	D+	67-70%	F	0-60%
A	93-96%	B	83-87%	C	73-77%	D	63-67%		
A-	90-93%	B-	80-83%	C-	70-73%	D-	60-63%		

Class contribution

Active contribution both in class and in laboratory meetings is essential to learning in this course. Contribution differs from attendance or participation. Attendance denotes being physically present, while participation denotes fulfilling the necessary requirements. Contribution includes attendance and participation, as well as active mental involvement that ultimately leads to learning, such as revising the material, working cooperatively with team members, raising inquiries, and so on. There will be many items for contribution, like: pre-labs, in-class discussions, laboratory activities, research notebooks, and data sharing. Contributions will be graded for thoughtful completion. Contributing in class is greatly appreciated in this course.

If you will be absent from a lab, please fill out the absence form on CANVAS. Any emails regarding absences, will not be addressed, all absences must be entered into the absence form. Please fill out the form once for each day you will be absent. This form must be filled out before the absence will occur (except in emergencies). Your response will be sent directly to your professor and IAs. If the absence is excused, participation points will be awarded, if not, participation points will not be awarded. Unexcused lab absences will result in no lab notebook/attendance points for that day. Unexcused absences include: 1) not completing a make-up assignment on time if a lab is not attended, 2) missing lab without first filling out the absence form, 3) arriving to lab 30min late or

more, 4) leaving lab with 15min or more remaining, 5) not participating during lab, 6) lab absences due to scheduling conflicts (other coursework, vacations, planned meetings, etc.), or 7) attending a lab section the student is not registered for. ***If a student is marked as absent for more than 2 lab sessions, they must drop the course as too much information has been missed.*** If a student refuses to drop the course, they will receive an automatic grade of "F" in the course after the drop deadline has passed.

Writing assignments

There will be four writing assignments during the course. Please see CANVAS throughout the quarter for more details.

Quizzes

There will be 3 short quizzes during the course. Quizzes will be cumulative and will focus on recently covered material. Please make sure to use the official resources provided by the course to study!

Pre-labs

In order to prepare for your lab sessions, you will do pre-labs that show the procedures in a concept map form or as drawings. Please ensure that you complete and submit the prelab to CANVAS before each lab session. The prelab involves drawing out the procedure for the day's lab, which your instructional assistant (IA) will verify at the start of the lab. The idea of the pre-lab is that you could do the lab exercise without looking at your notebook, that all the required information is there. Please remember to bring the prelab with you to the lab, either in paper format or on an electronic device such as an iPad. There is no prelab for Weeks 1, 9, and 10. Students who have an excused absence for lab will still need to submit the prelab to CANVAS by no later than 3 business days after the missed lab – failure to do so will result in a missed prelab.

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 or stations where they are required to perform specific experiments, analyses, or observations. For example, using a pipette, reading a gel electrophoresis, taking the average of data in excel, analyzing a graph, etc. The lab practicals will be timed and conducted individually. They are an important component of evaluating student's overall understanding of the lab material. Students who have an excused absence for lab will complete the lab practical in the next lab that they attend (please reach out to your IA or Dr. González-Gamboa to coordinate this) – failure to do so will result in a missed lab practical.

Project/Poster

Our final project will be a research proposal written and presented collaboratively in teams. Each team will identify a topic to study hypothetically and propose experiments to investigate that topic. The group poster presentation will be 10% of the course grade and the Q&A of the presentation will be another 5%. Because different people may excel in different ways, the group poster presentation or Q&A, whichever is higher for each individual, will be scaled to 10% instead of 5%. Together they will total 15%.

Professionalism

This 3% portion of the course grade is 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 in steps of 0.5 or 1%.

Regrades

If a grading error has been made, please submit a regrade request to Dr. González-Gamboa 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 / Teamwork

A major goal of the course is to learn to collaborate with others. Unfortunately, despite best efforts and intentions, teams 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 team work as part of the university learning community. Please see the Academic Integrity section for more information.

If significant disputes occur over the relative contribution of individual members of the team, students can submit an appeal. In such cases, the team grade will be multiplied by the number of members in the team, and the points can be divided among individuals based on what each team member agrees that they deserve from their individual efforts. To submit an appeal, all members of the team need to get together and provide the following information in a document: clear and detailed descriptions of each member's contribution, calculations and explanations for how the points should be divided among the members, and signatures from each member with a statement attesting to the fact that everyone in the team has agreed to all information in the appeal document. Please submit the appeal to Dr. González-Gamboa within one week of the assignments being returned.

ACCESSIBILITY AND INCLUSION

<http://disabilities.ucsd.edu> | osd@ucsd.edu | 858-534-4382

Any student with a disability is welcome to contact us early in the quarter to work out reasonable accommodations to support their success in this course. Students requesting accommodations for this course due to a disability must provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD). Students are required to present their AFA letters to faculty and to the OSD Liaison in the Division of Biological Sciences in advance so that

accommodations may be arranged. Whenever possible, we will use universal designs that are inclusive. If you have feedback on how to make the class more accessible and inclusive, please get in touch!

DISCRIMINATION AND HARASSMENT

The Office for the Prevention of Harassment & Discrimination (OPHD) provides assistance to 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.

ACADEMIC INTEGRITY

Honesty is primarily the responsibility of each student. 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.

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 (see Case 1 or 2 below):

- Case 1: Citing when tools used ONLY for copy editing. (See below)
- Case 2: Citing when tools used in any other way. (See below)

Case 1: You have only used an online tool to improve the clarity of your writing without changing the content or information contained. This is known as copy editing. If anyone has done this for anything in the course (eg., lab notebook, writing assignment, etc.) this phrase MUST be added to the end of the assignment:

"This assignment was edited for clarity and conciseness using [INSERT NAME OF TOOL HERE: ChatGPT, Grammarly, Copilot, Claude.ai]. I take full responsibility for all the ideas, opinions, and facts herein. I acknowledge that generative AI cannot independently verify the accuracy of the information it provides and it is my responsibility to do so."

Case 2: You have done anything else with generative AI that was used in the process of completing the assignment. This can include, but is not limited to: brainstorming and summarizing concepts. It includes any time you have received anything considered creative or scientific content from the tool. Then the following MUST be included in your references/citations:

1. Prompts given to the AI: "<List prompt(s)>"
2. AI's direct output: "<Paste the output generated by the AI system>"
3. Your modifications to the output: "<explain the actions taken>"
4. How did you verify the information? Did you have to fact-check online?

Example:

1. Prompt for ChatGPT: "Discuss the impact of climate change on marine biodiversity."
2. AI's output: "Climate change has led to ocean acidification, causing coral bleaching and marine species decline."
3. My modifications: Added recent stats and specific species examples and I fact-checked the gen AI claims at:
4. How does climate change affect coral reefs? (n.d.). <https://oceanservice.noaa.gov/facts/coralreef-climate.html>

AI can assist, **but it cannot be the main contributor to your assignment.** Remember: mastering AI, like any skill, takes effort. Over-relying on it shortchanges your education and has lasting consequences. Also note that AI can sometimes produce misleading or false information. Be especially wary with images. You're accountable for every submission, AI-assisted or not.

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.

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.