

## Syllabus

### **BILD 4 – Introductory Biology Lab (2 credits)**

**Winter 2024 (1/8/24 – 3/18/24)**

Instructor: Prof. Ivonne González-Gamboa

Email: [igonzalezgamboa@ucsd.com](mailto:igonzalezgamboa@ucsd.com) (please put BILD 4 in the subject line)

Office Hour: M, 2:30 – 3:30 pm. Location TBD (will be posted on CANVAS)

**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. Two late attendances will be counted as one absence. 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	5 pm – 6:20 pm	WLH 2005

### Lab:

Section	Day	Time	Room	IA
D01	T	9 am – 11:50 am	TATA 2301	Je Seung
D02	T	9 am – 11:50 am	TATA 2302	Benjamin
D03	T	9 am – 11:50 am	TATA 2303	Poorvi
D04	T	9 am – 11:50 am	TATA 2304	Pawel
D05	Th	9 am – 11:50 am	TATA 2301	Je Seung
D06	Th	9 am – 11:50 am	TATA 2302	Benjamin
D07	Th	9 am – 11:50 am	TATA 2303	Poorvi
D08	Th	9 am – 11:50 am	TATA 2304	Pawel

### IA information:

IA name	IA email
Je Seung An	j4an@ucsd.edu
Benjamin Lee	bel008@ucsd.edu
Poorvi Saini	psaini@ucsd.edu
Pawel Bartosz, Vijayakumar	pbvijaya@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.

<b>Week</b>	<b>Dates</b>	<b>Lecture Mondays</b>	<b>Lab Tuesday D01-D04 or Thursday D05-D08</b>
1	1/8 1/9 1/11	Class intro, finding sources, microbiomes	Ice breaker, lab intro, literature search exercise (SL), field trip to reserve (FW1) to collect soil.
2	1/15 1/16 1/18	HOLIDAY (watch recorded lecture before lab) Beginning basics: pipetting, introductory statistics, excel	Pipetting (BB1, BB2), WA 1 due Sunday 1/21.
3	1/22 1/23 1/25	Soil properties, pH, invasive plants	Measure soil pH (SP1), save soil aliquots (GB1), start group project ideas, set up moisture (SP2). Quiz 1 due Sunday 1/28.
4	1/29 1/30 2/1	Functional biodiversity: plating, identifying bacterial species, replicates, controls	Plate soil samples (TB1), moisture part 2 (SP3), WA 2 due Sunday 2/4.
5	2/5 2/6 2/8	Functional biodiversity: colony morphology, ecoplate setup	Analyze plates (TB2), ecoplate setup (FB1), Quiz 2 due Sunday 2/11.
6	2/12 2/13 2/15	Functional biodiversity: graphing, ecoplate calculations, chi-square	Ecoplate read and analysis (FB2, FB3), continue project ideas.
7	2/19 2/20 2/22	HOLIDAY (watch recorded lecture before lab)	Work on poster, WA 3 due on Sunday 2/25.
8	2/26 2/27 2/29	Genomic biodiversity: sampling, DNA extraction, nanodrop, PCR	DNA extraction (GB2), nanodrop, run 16s PCR (GB3), Quiz 3 due on Sunday 3/3.
9	3/4 3/5 3/7	Genomic biodiversity: gel electrophoresis, clean-up	Gel electrophoresis of PCR (GB4), clean-up (GB5), finish posters, Quiz 4 due on Sunday 3/10.
10	3/11 3/12 3/14	Scientific talks	WA 4 due in lab section.
Finals Week	3/18	Poster presentations 7-10 pm	

### Grading

BILD 4 has five grading components:

- Class contribution 40%
- Writing assignments 30%
- Quizzes 10%
- Final presentation 15%
- Professionalism 5%

These five 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, i.e. 20% of students getting A, B, C, and such. 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%		

### 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 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 15min 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 2 lab sessions and/or misses four lab quizzes, 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 4 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!

### Online resources/pre-assignments

In order to prepare for your lab sessions, you can make use of various online resources, simulations, and software available. These tools will provide you with a hands-on learning experience and allow you to practice lab techniques, analyze data, refresh the concepts learn in class and troubleshoot your project.

### 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 5% 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](mailto: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](mailto: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](mailto: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

<https://students.ucsd.edu/academics/academic-integrity/index.html> Integrity of scholarship is essential for an academic learning community. In this course and at the university, we expect that both students and the instructional team will honor this principle and in so doing protect the validity of university intellectual work. For students, this means that all academic work will be done by the individual to whom it is assigned, without unauthorized aid of any kind. Instructors, for their part, will exercise care in planning and collaborating with students on academic work, so that academic integrity is upheld. When people collaborate to work toward a common goal, shared values must be established so that everyone understands the acceptable ways for working together. In organizations, these are commonly called codes of conduct or ethics. In this course, we are using a statement of values<sup>4</sup> in support of codes of ethics, like the Policy on Integrity of Scholarship, to state explicitly our values and describe the behaviors for maintaining and protecting those values.

	As students, we will...	As the instructional team, we will...
Honesty	<ul style="list-style-type: none"> <li>Honestly demonstrate your knowledge and abilities according to expectations listed in the syllabus or in relation to specific assignments and exams</li> <li>Communicate openly without using deception, including citing appropriate sources.</li> </ul>	<ul style="list-style-type: none"> <li>Give you honest feedback on your demonstration of knowledge and abilities on assignments and exams</li> <li>Communicate openly and honestly about the expectations and standards of the course through the syllabus and in relation to assignments and exams</li> </ul>
Responsibility	<ul style="list-style-type: none"> <li>Complete assignments on time and in full preparation for class</li> <li>Show up to class on time and be mentally physically present</li> <li>Participate fully and contribute to team learning and activities</li> </ul>	<ul style="list-style-type: none"> <li>Give you timely feedback on your assignments and exams</li> <li>Show up to class on time and be mentally and physically present</li> <li>Create relevant assessments and class activities</li> </ul>
Respect	<ul style="list-style-type: none"> <li>Speak openly with one another while respecting</li> </ul>	<ul style="list-style-type: none"> <li>Respect your perspectives even while we challenge you to think more deeply and critically</li> </ul>

	<ul style="list-style-type: none"> <li>diverse viewpoints and perspectives</li> <li>• Provide sufficient space for others to voice their ideas</li> </ul>	<ul style="list-style-type: none"> <li>• Help facilitate respectful exchange of ideas</li> </ul>
Fairness	<ul style="list-style-type: none"> <li>• Contribute fully and equally to collaborative work, so that we are not freeloading off of others on our teams</li> <li>• Not seek unfair advantage over fellow students in the course</li> </ul>	<ul style="list-style-type: none"> <li>• Create fair assignments and exams and grade them in a fair and timely manner</li> <li>• Treat all students and collaborative teams equally.</li> </ul>
Trustworthiness	<ul style="list-style-type: none"> <li>• Not engage in personal affairs while on class time</li> <li>• Be open and transparent about what we are doing in class</li> <li>• Not distribute course materials to others in an unauthorized fashion</li> </ul>	<ul style="list-style-type: none"> <li>• Be available to all students when we say we will be</li> <li>• Follow through on our promises</li> <li>• Not modify the expectations or standards without communicating with everyone in the course</li> </ul>
Courage	<ul style="list-style-type: none"> <li>• Say or do something when we see actions that undermine any of the above values</li> <li>• Accept a lower or failing grade or other consequences of upholding and protecting the above values</li> </ul>	<ul style="list-style-type: none"> <li>• Say or do something when we see actions that undermine any of the above values</li> <li>• Accept the consequences (e.g. lower teaching evaluations) of upholding and protecting the above values</li> </ul>

All course materials are the property of the instructor, the course, and University of California, San Diego and may not be posted online, submitted to private or public repositories, or distributed to unauthorized people outside of the course. Any suspected instances of a breach of academic integrity will be reported to the Academic Integrity Office for review. A breach of academic integrity may result in a zero the assignment/test/participation item in question and/or a failed grade in the course. The impact of the breach on a grade will be determined by the instructor in consultation with the Academic Integrity Office.

#### 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.