

[Welcome to Introductory Biology Laboratory!](#) BILD 4 aims to develop an understanding for research in the biological sciences through inquiry-based laboratory experiments. We will work in groups to collect, analyze, and present original research data while learning foundational biological concepts and laboratory skills. Data collected in this course will contribute to an on-going research project on soil microbiomes at the Scripps Coastal Reserve on campus.

LEARNING GOALS

- Collaborate with one another to learn foundation biological concepts and laboratory skills
- Engage in research and learn to draw conclusions based on evidence and reasoning
- Connect with resources on campus, such as faculty research groups, library, and writing center

MAJOR COMPONENTS

- Lecture: 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

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 should use universal designs that are inclusive. For example, colors used in this syllabus are distinguishable by most colorblind and non-colorblind people, and this font is designed to be dyslexic friendly.

ACADEMIC INTEGRITY

<https://students.ucsd.edu/academics/academic-integrity/index.html>

Integrity of scholarship is essential for an academic community. The University expects that both students and faculty 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(s) to whom it is assigned, without unauthorized aid of any kind.

In this course, we need to establish a set of shared values. Following are values adopted from the International Center for Academic Integrity (<http://www.academicintegrity.org/icaei/home.php>), which serve as the foundation for academic integrity. These values include: honesty, responsibility, respect, fairness, and trustworthiness.

COURSE LOGISTICS

Required materials: The BILD 4 Laboratory Manual, [knee-length](#) laboratory coat, [and](#) UV-blocking safety glasses or goggles are required for the laboratory and are available at the bookstore. iClicker2 is required for lectures. iClicker2 is available at the bookstore and should be [registered on TED](#).

Lecture	Time	Location	Instructor
A00	Thursday 5:00-6:20 pm	Solis 107	Stanley Lo

Laboratory	Time	Location	Instructional assistants
A01	Friday 10:00 am to 1:00 pm	York 4124A	Michael Wu, Tabettha Ridgway
A02	Friday 2:00 pm to 5:00 pm	York 4124A	Daryn Longman, Michael Wu
A03	Monday 8:00 am to 11:00 am	York 4124A	Givon Sanati, Kshitij Gaur
A04	Monday 12:00 pm to 3:00 pm	York 4124A	Garrett Wong, Givon Sanati
A05	Monday 4:00 pm to 7:00 pm	York 4124A	Hesper Wong, Sung Beck
A06	Tuesday 8:00 am to 11:00 am	York 4124A	Hesper Wong, Zheng Liu
A07	Tuesday 12:30 pm to 3:30 pm	York 4124A	Chris Steinke, Kenneth Collado
A08	Tuesday 4:00 pm to 7:00 pm	York 4124A	Chris Steinke, Zheng Liu

Instructor	Email	Office	Phone	Office hours
Stanley Lo	smlo@ucsd.edu	York 4070B	858-246-1087	W 3-4 pm, Th 10-11 am, by appt

Instructional assistant	Email	Instructional assistant	Email
Chris Steinke	clsteink@ucsd.edu	Kshitij Gaur	kgaur@ucsd.edu
Daryn Longman	dlongman@ucsd.edu	Michael Wu	mbwu@ucsd.edu
Garrett Wong	grwong@ucsd.edu	Sung Beck	sjbeck@ucsd.edu
Givon Sanati	gsanati@ucsd.edu	Tabetha Ridgway	tridgway@ucsd.edu
Hesper Wong	hpw001@ucsd.edu	Zheng Liu	zhli026@ucsd.edu
Kenneth Collado	kcollado@ucsd.edu		

LEARNING IN THIS COURSE

BILD 4 is designed to be a collaborative environment for everyone to learn together and construct a shared understanding of the material. Active participation both in lectures and in the laboratory is expected. To encourage collaboration, many activities in the course will be done in groups, and grades will not be assigned on a curve. (See grading section for more details.)

Instead of memorization, we will focus on developing an understanding of fundamental concepts as they apply to different examples and learn to draw conclusions based on evidence and reasoning. Therefore, quizzes will include questions that are based on solving problems in new contexts, and laboratory reports and the research proposal will challenge us to think critically about data.

GRADING

BILD 4 has four grading components: participation (20%), quizzes (30%), laboratory reports (20%), and research proposal (20%). Because different people may excel in different aspects, the laboratory reports or research proposal component, whichever is higher for each individual, will be scaled to 30% instead of 20%, bringing the total to 100%.

The general grading scheme is as follows, but it may be adjusted to improve everyone's grades if necessary. Exact boundaries will be determined based on final grade distributions: Because course assessments are not perfectly precise, grade cutoffs will be identified by large gaps in between individual scores. However, 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+	97-100%	B+	87-90%	C+	77-80%	D+	67-70%	F	0-60%
A	93-97%	B	83-87%	C	73-77%	D	63-67%		
A-	90-93%	B-	80-83%	C-	70-73%	D-	60-63%		

Participation: Active participation both in lectures and in the laboratory is essential to learning. There will be many participation items, including pre-lecture and pre-laboratory assignments, in-lecture discussions, in-laboratory activities, and laboratory notebooks. Participation will be graded for thoughtful completion, and 80% participation items (rounded up to whole items) will be counted.

Quizzes: Quizzes will be open resources (e.g. notes and calculators **but not electronic equipment that can be used to communicate with others**). Quizzes will be cumulative but will focus on the most recent material. There will be 2 short quizzes (30 minutes) and 1 long quiz (90 minutes) that count as 3 short quizzes. Out of 5 quiz equivalents, the top 4 quiz grades (5% each) will be counted.

To facilitate reflection and learning from quizzes, each quiz (small or large) will be in two phases: The first phase will be done individually (15 or 45 minutes), and the second phase will be the same quiz done again in groups (15 or 45 minutes). The individual portion will count for 80% of the quiz grade, and the group portion will count for 20%.

Laboratory reports: Two laboratory reports will be written in groups in the format of papers from research journals. We will use the Division of Biological Sciences undergraduate research journal Saltman Quarterly (<http://sq.ucsd.edu/>) as a guide. The first laboratory report (5%) is one page, and the second laboratory report (15%) is four pages.

Research proposal: The project will be a research proposal written collaboratively in groups. Each group will identify a topic to study hypothetically and propose experiments to investigate that topic using foundational concepts and laboratory skills learned in the course. The research proposal will be presented in poster format, and the presentation will be graded as a group effort.

LABORATORY SAFETY

Safety precautions are crucial in the laboratory setting. Appropriate personal protective equipment (PPE) is required: including laboratory coats that cover to the knees, UV-blocking safety glasses or goggles, long pants or equivalent, and closed-toe and closed-heel shoes.

LABORATORY ATTENDANCE

Attendance in laboratory is required. Missing two laboratory sessions, except in the case of a documented short-term illness or serious family emergency, will automatically result in an **F grade**. 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. Additional policies are available online (<https://biology.ucsd.edu/education/undergrad/course/waitlist.html>).

ASSIGNMENTS AND QUIZZES

No late participation items will be accepted, and no make-up quizzes will be offered, as only up to 80% of these grades are counted. No late assignments (i.e. laboratory reports and the research proposal) will be accepted, except in the case of a documented short-term illness or serious family emergency. Please coordinate within groups to ensure that group assignments are completed.

LECTURE PODCAST

<http://podcast.ucsd.edu/>

Whenever possible, lectures will be recorded and available online as videos as a resource for review. However, attendance and participation are highly encouraged, as **substantial portions of lectures will be interactive**. Please see participation in the grading section for more details.

LIBRARY GUIDE

<http://ucsd.libguides.com/bild4>

A specific library guide has been designed for BILD 4. This website serves as the starting point for navigating campus library resources that support our needs in completing major assignments, including laboratory reports and the research proposal. Please feel free to schedule a consultation with Bethany Harris (bethany@ucsd.edu), our biomedical librarian, for further assistance.

WRITING CENTER

<https://writingcenter.ucsd.edu/>

The Writing Center provides support for undergraduates working on course papers (i.e. laboratory reports and the research proposal) and independent writing projects. Writing mentors can help at any stage of the writing process, from brainstorming to final polishing.

The Writing Center offers: one-on-one appointments for undergraduates with peer writing mentors; group workshops addressing a variety of writing projects, genres, and issues; and Drop-In Zone for quick questions, targeted assistance, and a comfortable writing space.

CALENDAR

A general outline for the course is available below. More specific details for each week, including reading and assignments, will be provided on TED and in class. We may also adjust the schedule as necessary, while still focusing on the foundational concepts and laboratory skills.

Please note that because of Thanksgiving, the weeks are from Thursday to Wednesday for most of the quarter. For example, week 1 is from Thursday 9/24 to Wednesday 9/30. After Thanksgiving, week 10 is from Monday 11/30 to Friday 12/4.

Week	Dates	Lecture	Laboratory	Deadlines
1	9/24 to 9/30	<ul style="list-style-type: none"> • BILD 4 introduction • Microbiomes 	<ul style="list-style-type: none"> • Asking questions • Error analysis 	---
2	10/1 to 10/7	<ul style="list-style-type: none"> • Forms of biodiversity • Ecoplate introduction 	<ul style="list-style-type: none"> • Scripps Coastal Reserve • Soil properties and Ecoplate 	---
3	10/8 to 10/14	<ul style="list-style-type: none"> • Measuring biodiversity • Ecoplate analysis 	<ul style="list-style-type: none"> • Ecoplate analysis • Data presentation 	---
4	10/15 to 10/21	<ul style="list-style-type: none"> • Quiz 1 • 16S rDNA sequences 	<ul style="list-style-type: none"> • Genomic DNA prep • Lab report peer review 	---
5	10/22 to 10/28	<ul style="list-style-type: none"> • DNA replication • Polymerase chain reaction 	<ul style="list-style-type: none"> • Polymerase chain reaction • Gel electrophoresis 	---
---	10/25 at 11:59 pm	---	---	Report 1
6	10/29 to 11/4	<ul style="list-style-type: none"> • Recombinant DNA • Biotechnology 	<ul style="list-style-type: none"> • Ligation • Transformation 	---
7	11/5 to 11/11	<ul style="list-style-type: none"> • Quiz 2 • DNA sequencing 	<ul style="list-style-type: none"> • Blue/white colony selection • Designing posters 	---
8	11/12 to 11/18	<ul style="list-style-type: none"> • Research opportunities for undergraduates 	<ul style="list-style-type: none"> • Designing posters 	---
---	11/21 at 11:59 pm	---	---	Poster
9	11/19 to 11/25	<ul style="list-style-type: none"> • Sequence alignment • Bioinformatics 	<ul style="list-style-type: none"> • Sequence analysis • Data presentation 	---
10	11/30 to 12/4	<ul style="list-style-type: none"> • Quiz 3-5 	<ul style="list-style-type: none"> • Lab report peer review 	---
---	12/6 at 11:59 pm	---	---	Report 2
Exam	12/9 at 8:00 am	<ul style="list-style-type: none"> • Poster presentations 	---	---