

[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 and should be [registered on TritonEd](#).

Lecture	Time	Location	Instructor
A00	Tuesday 8:00–9:20 am	Solis 107	Stanley Lo

Laboratory	Time	Location	Instructional assistants
A01	Tuesday 9:30 am to 12:30 pm	York 4124	Jerry Liu, Yalin Deng
A02	Tuesday 1:00 pm to 4:00 pm	York 4124	Garrett Wong, Jerry Liu
A03	Tuesday 4:30 pm to 7:30 pm	York 4124	David Lenh, Raymond Diep
A04	Cancelled	---	---
A05	Wednesday 12:00 pm to 3:00 pm	York 4124	Jonathan Pham, Madan Mukundan,
A06	Wednesday 4:00 pm to 7:00 pm	York 4124	Kendall Higgins, Natalie Toothcare
A07	Wednesday 10:00 am to 1:00 pm	York 1310	AJ Massri, Calvin Lee
A08	Wednesday 2:00 pm to 5:00 pm	York 1310	Calvin Lee, Sally Cho

Instructor	Email	Office	Phone	Office hours
Stanley Lo	smlo@ucsd.edu	York 4070B	858-246-1087	See rotating schedule

Instructional assistant	Email	Instructional assistant	Email
AJ Massri	amassri@ucsd.edu	Kendall Higgins	kthiggin@ucsd.edu
Calvin Lee	ckl028@ucsd.edu	Madan Mukundan	mmukunda@ucsd.edu
David Lenh	dlenh@ucsd.edu	Natalie Toothacre	ntoothac@ucsd.edu
Garrett Wong	grwong@ucsd.edu	Raymond Diep	rhdiep@ucsd.edu
Jerry Liu	jcl042@ucsd.edu	Sally Cho	n7cho@ucsd.edu
Jonathan Pham	jtp002@ucsd.edu	Yalin Deng	y3deng@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 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 40 minutes), and the second phase will be the same quiz done again in groups (15 or 40 minutes). The individual portion will count for 80% of the quiz grade, and the group portion will count for 20%.

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

Poster project: The project will be a research proposal written and presented in poster format collaboratively in groups (15%). 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. An individual component (5%) will involve critiques and summaries of other posters.

LABORATORY SAFETY

Safety precautions are crucial in the laboratory setting. Biology lab safety training and assessment (<https://biology.ucsd.edu/education/undergrad/course/ug-labs.html>) must be completed by the beginning of the first lab in week 1.

From the beginning of the first lab, appropriate laboratory attire and personal protective equipment (PPE) are required, including laboratory coats that cover to the knees, UV-blocking safety glasses or goggles, long pants or equivalent, long socks or equivalent, and closed-toe and closed-heel shoes. No skin should be exposed from the waist down at all times.

LABORATORY ATTENDANCE

Attendance in laboratory is required. Missing one 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. papers and poster projects) 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 the papers and 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 TritonEd and in class. We may also adjust the schedule as necessary, while still focusing on the foundational concepts and laboratory skills.

Week	Dates	Lecture	Laboratory	Deadlines
1	3/27-4/2	<ul style="list-style-type: none"> • BILD 4 introduction • Microbiomes 	<ul style="list-style-type: none"> • Asking questions • Error analysis 	---
2	4/3-4/9	<ul style="list-style-type: none"> • Forms of biodiversity • Ecoplate introduction 	<ul style="list-style-type: none"> • Scripps Coastal Reserve • Soil properties, Ecoplate 	---
3	4/10-4/16	<ul style="list-style-type: none"> • Measuring biodiversity • Ecoplate analysis 	<ul style="list-style-type: none"> • Ecoplate analysis • Data presentation 	---
4	4/17-4/23	<ul style="list-style-type: none"> • Quiz 1 • 16S rDNA sequences 	<ul style="list-style-type: none"> • Genomic DNA prep • Paper 1 peer review 	---
---	Sum 4/24 11:59 pm	---	---	Paper 1
5	4/24-4/30	<ul style="list-style-type: none"> • DNA replication • Polymerase chain reaction 	<ul style="list-style-type: none"> • Polymerase chain reaction • Gel electrophoresis 	---
6	5/1-5/7	<ul style="list-style-type: none"> • Recombinant DNA • Biotechnology 	<ul style="list-style-type: none"> • Ligation and transformation • Asking questions 	---
7	5/8-5/14	<ul style="list-style-type: none"> • Quiz 2 • DNA sequencing 	<ul style="list-style-type: none"> • Colony selection • Designing posters 	---
8	5/15-5/21	<ul style="list-style-type: none"> • Research opportunities for undergraduates 	<ul style="list-style-type: none"> • Designing posters 	---
9	5/22-5/28	<ul style="list-style-type: none"> • Sequence alignment • Bioinformatics 	<ul style="list-style-type: none"> • Sequence analysis • Data presentation 	---
---	Sun 5/29 at 11:59 pm	---	---	Poster
10	5/29-6/4	<ul style="list-style-type: none"> • Quiz 3-5 	<ul style="list-style-type: none"> • Paper 2 peer review 	---
---	Fri 6/3 at 12:59 pm	---	---	Paper 2
Exam	Thurs 6/9 at 8:00 am	<ul style="list-style-type: none"> • Poster presentations 	---	---