Welcome to Introductory Biology Laboratory!

BILD 4 aims to develop an understanding for research in the biological sciences through laboratory experiments. We will work in teams to collect, analyze, and present original 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 in the California Floristic Province.

Learning goals

- Collaborate with one another to learn foundation biological concepts and laboratory skills
- Engage in research and learn to construct scientific arguments based on evidence and reasoning
- Develop and present research proposals in a conference setting
- Learn about research opportunities and other resources 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

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 contribution in class and in the laboratory is essential because many ideas that will be developed in these activities cannot be easily captured otherwise. Being able to communicate understanding and articulate confusion is both useful for learning (Smith 2009) and critical to success in any discipline. To encourage collaboration and community building, many activities and assignments will be done in teams, and grades will not be assigned on a curve.

Instead of memorization, we will focus on developing an understanding of fundamental concepts and laboratory skills as they apply to different examples and learn to draw conclusions based on evidence and reasoning. We will utilize class and laboratory time to construct and apply our knowledge, troubleshoot challenging topics, practice problem solving, and develop skills in critical thinking. Assignments will challenge us to think critically about data and experiments.

Course logistics

The core learning components in this course are comprised of collaborative activities, in addition to independent and team work on studying and completing assignments. A substantial portion of learning will be from original research data, and assignments will be designed to support this more complex level of learning. Course materials, announcements, and other important details will be available on the Canvas (https://canvas.ucsd.edu/). Please check the course website and your @ucsd email regularly for updates.

We will meet synchronously for both lecture and laboratory sections for collaborative activities. You should attend the sections that you are enrolled in, and we are not able to change the maximum number of enrolled students in a section. **If a student is marked as late or absent for more than two laboratory sections, they will receive an automatic grade of "F" per biological sciences laboratory course policy.**

Course materials: Assigned readings for this course will be from various sources including primary literature papers and will be posted on Canvas. An updated laboratory manual will be made available digitally on Canvas. For the laboratory, knee-length laboratory coat and safety glasses or goggles are required, and they are available at the bookstore.

Podcast (http://podcast.ucsd.edu/): Whenever possible, classes will be recorded 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.

Technology: Students are welcome to bring laptop computers, tablets, or similar technology to class meetings and sections for note-taking purposes. Please see this research study, which shows that multi-tasking on computers in class is likely to decrease not only your own grade but also the grades of people around you who can see your screen (Sana 2013). For this reason, we ask that you do not flip between relevant course materials and irrelevant activities on the internet.

Laboratory safety | Website: https://biolabclass-safetyquiz.ucsd.edu/introduction
Safety precautions are crucial in the laboratory setting. The online student 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 meeting without completing this training.

Proper laboratory attire is required at all times! Proper laboratory attire includes full-length pants or equivalent with no holes or tears, long socks that cover the ankles, and closed-toe and closed-heel shoes. No skin should be exposed from the waist down. Personal protective equipment (PPE) is required for laboratory work. PPE includes knee-length laboratory coats and safety glasses or googles, both of which are available at the bookstore. Gloves will be provided in the laboratory.

Laboratory contribution | Website: https://biology.ucsd.edu/education/undergrad/course/ug-labs.html
Enrolled students must attend the first laboratory meeting to keep their spots in the course. Attendance and active participation and contribution in laboratory are required. Please be on time for laboratory meetings as responsible conduct for being in a learning community with your peers. We understand that emergencies do happen. In case of emergencies, please contact the course instructor and the instructional assistants as soon as possible. Being late or missing laboratory meetings without a legitimate excuse is unprofessional and will result in deductions from the course grade.

References

Sana et al. (2013) Computers and Education 62: 24-31.
http://www.sciencedirect.com/science/article/pii/S0360131512002254
Smith et al. (2009) Science 323: 122-124.
http://science.sciencemag.org/content/323/5910/122.short

Academic integrity | Website: https://academicintegrity.ucsd.edu/

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 our intellectual work. For students, this means that all academic work will be done by the individuals to whom it is assigned, without unauthorized aid of any kind. The instructional team will exercise care in planning and collaborating with students on academic work.

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 this course, we are using a statement of values to describe the behaviors for maintaining and protecting these values. The statement is open to discussions and possible alterations based on mutual agreements among all students and the instructional team. In collaborative work, each team should discuss these values and agree on mutual expectations.

The following course statement of values is adapted from the Academic Integrity Office:

	As students, we will ...	As the instructional team, we will ...
Honesty	• Honestly demonstrate knowledge and abilities according to expectations • Communicate without using deception, e.g. citing appropriate sources	• Give honest feedback • Communicate honestly about expectations and standards through the syllabus and course materials
Responsibility	• Complete assignments on time • Be on time and fully contribute to learning activities in the course	• Give timely feedback • Be on time and mentally present • Create relevant activities for learning
Respect	• Speak openly with one another while respecting diverse perspectives • Provide sufficient space for others	• Respect different perspectives • Help facilitate respectful exchanges
Fairness	• Contribute fully and equally to collaborative work • Not seek unfair advantage	• Create fair assessments and grade them in a fair and timely manner • Treat all students equitably
Trustworthiness	• Focus on relevant work while in class • Not distribute course materials to others in an unauthorized fashion	• Be available to all students when we say we will be • Follow through on our promises
Courage	• Say or do something when we see actions that undermine these values • Accept consequences for upholding and protecting the above values	• Say or do something when we see actions that undermine these values • Accept consequences for upholding and protecting the above values

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.

Principles of community | Website: https://ucsd.edu/about/principles.html
Our campus is dedicated to learning, teaching, and serving society through education, research, and public service. Our international reputation for excellence is due in large part to the cooperative and entrepreneurial nature of the UC San Diego community. Faculty, staff, and students are encouraged to be creative and are rewarded for individual as well as collaborative achievements.

To foster the best possible working and learning environment, we strive to maintain a climate of fairness, cooperation, and professionalism. These principles of community are vital to the success of the University and the well-being of its constituents. Faculty, staff, and students are expected to practice these basic principles as individuals and in groups.

Accessibility and inclusion | Website: http://disabilities.ucsd.edu | Contact: osd@ucsd.edu
Any student with a disability is welcome to contact us early in the quarter to work out reasonable accommodations to support their academic success. 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 discuss accommodation arrangements with the instructor and OSD liaisons in the program in advance of any exams or assignments.

Whenever possible, we will 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. If you have feedback on how to make the course more accessible and inclusive, please get in touch!

Discrimination and harassment | Website: http://ophd.ucsd.edu | Contact: ophd@ucsd.edu
The Office for the Prevention of Harassment & Discrimination (OPHD) provides assistance to students, faculty, and staff regarding reports of bias, harassment, and discrimination. The mission of OPHD is to educate the entire UC San Diego community about these issues and to assist with the prevention and resolution of these issues in a fair and responsible manner. In collaboration with other UC San Diego resources, OPHD promotes an environment in which all members of the UC San Diego community can work, learn and live in an atmosphere free from all forms of bias, harassment and discrimination.

Students may feel more comfortable discussing their particular concern with a trusted employee, such as a student affairs staff member, faculty member, 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. Our campus is committed to upholding policies regarding discrimination and harassment.

Grading

Our course has the following grading components: contribution (10%), writing assignments (28%), Canvas and in-lab practical quizzes (28%), project (28%), professionalism (2%), and extra credit (0.05%). Because different people may excel in different aspects of the course, the highest component among writing assignments, quizzes, and the project for each individual will be scaled from 28% to 32%, bringing the total to 100%. There are no opportunities for extra credit beyond what is assigned.

The general grading scheme is as follows, although 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, our course is not graded on a curve, e.g. 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+	99–100%	B+	87–89.99%	C+	77–79.99%	D	60–69.99%
A	93–98.99%	B	83–86.99%	C	73–76.99%	F	0–59.99%
A–	90–92.99%	B–	80–82.99%	C–	70–72.99%		

Contribution: Active contribution both in class and in laboratory meetings is essential to learning in this course. Contribution is different from attendance or participation. Attendance means that we are merely physically present. Participation means that we have completed the required activities. Contribution involves attendance, participation, and active mental engagement that ultimately results in learning, e.g. thinking through the material, collaborating meaningfully with teammates, asking questions, etc.

There will be many contribution items, including pre-assignments, in-class discussions, laboratory activities, research notebooks, and data sharing. Contributions will be graded for thoughtful completion on a scale 0, 1, and 2. Because individuals may have different competing schedules, completing 90% or more of all contribution items will earn the full contribution grade.

The best way to learn how to solve problems and deepen our understanding is to work through the class and laboratory activities and discuss them with fellow classmates and the instructional team. To do so, we will discover and construct an understanding together instead of directly giving answers to the problems.

Writing assignments: These 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. Please see Canvas throughout the quarter for more details.

Canvas and in-lab practical quizzes: We will have lab practical tests in sections, which will be opportunities to demonstrate mastery of laboratory skills learned in the course. Canvas quizzes for course content will be cumulative and will focus on the most recent material. Quizzes will be available on Canvas for 48–72 hours and will be 30 minutes each. Practice quizzes will also be posted on Canvas. Please make sure to use the official resources provided by the course to study!

Project: 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. Please see Canvas throughout the quarter for more details.

Professionalism: This 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 (described in this section) and community efforts (extra credit described in the section below). 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 instructional 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.

Example interactions with meaningful benefits that:

- Developing deeper insight into course material, concepts, biology, and/or society in general
- Working collaboratively to improve in skill building and future opportunities
- Learning conceptually and meaningfully why full credit was not awarded for an assignment
- Clarifying course material that facilitates deeper learning
- Carrying out procedures safely and paying attention to waste disposal in the laboratory

Example interactions that have no meaningful benefits and thus should be avoided:

- Contributing inequitably to team work in class, in section, or on team assignments
- Being disruptive to fellow students in class, in section, or on team assignments
- Harassing and/or bullying other students or the instructional team, either in person or online
- Ignoring the directions or requests from the instructional team, especially in relation to safety
- Neglecting safety in the laboratory and not paying attention to waste disposal in the laboratory

Extra credit: The 0.05% extra credit is based on community professionalism, which can be earned by completing course evaluations and related surveys that are aimed to improve the course and the educational experiences of your future peers. If 90% or more of all students complete SETs, instructional assistant evaluations, and other course-based evaluation surveys in a mature and professional fashion (i.e. taking them seriously and providing timely and constructive feedback), extra credit will be added to everyone in the course. There are no other opportunities for extra credit beyond what is already assigned.

Late or missing assignments: In general, we are unable to accept late or missing assignments because of the size of the course. This means that no late contribution items will be accepted; completing 90% of contribution items will earn the full contribution grade. However, we acknowledge that emergencies do occur. For missed quizzes, writing assignments, or project due to documented short-term illness or serious family emergency, please contact the course instructor and instructional assistants as soon as possible or reasonable to do so. We are here to help you succeed in the course!

Regrades: If a grading error has been made, please submit a regrade request to the course instructor within one week of the assignments being returned. Send a message to the instructor with a concise description or explanation for the regrade 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.

Team work: A major goal of the course is to learn to collaborate with others. Unfortunately, despite best efforts and intentions, teams do not always functional 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 the course instructor within one week of the assignments being returned.

Use of generative artificial intelligence (GenAI): GenAI has the potential to transform education, workplace, and beyond. We should learn together to use it ethically. GenAI is neutral by nature, neither good nor bad. Its value hinges on how it is used and applied. We acknowledge the potential of GenAI to both elevate and diminish our collective academic experience. While it can be a powerful tool, it does not absolve us from upholding academic integrity and principles of community.

We own our work. GenAI can assist, but it should not be the main contributor. Remember that mastering GenAI, like any skill, takes effort. Over-relying on it shortchanges our education and can have lasting consequences. Furthermore, GenAI such as large language models can sometimes produce misleading or false information. Be especially wary with images. We are accountable for our own work, GenAI-assisted or not. Therefore, always fact-check GenAI-generated content before submission. Make sure to properly attribute credit to GenAI by describing the process in which it has been used in our work.

Need help? Please consult the instructor, instructional assistants, and library resources: https://ucsd.libguides.com/AI

Meeting times

Please note that dates are listed in US format of month/day; for example, 1/2 means January 2nd. All times are listed in California or Pacific time zone.

Class	Day	Time	Location	Instructor	Email
D00	Monday	6:30–7:50p	PCYNH 109	Stanley Lo	smlo@ucsd.edu

Section	Day	Time	Location	Instructional assistants	Email
D01	Tuesday	1:00p–3:50p	Tata 2301	Information for instructional assistants will be posted on Canvas course site	
D02	Tuesday	1:00p–3:50p	Tata 2302		
D03	Tuesday	1:00p–3:50p	Tata 2303		
D04	Tuesday	1:00p–3:50p	Tata 2304		
D05	Thursday	1:00p–3:50p	Tata 2301		
D06	Thursday	1:00p–3:50p	Tata 2302		
D07	Thursday	1:00p–3:50p	Tata 2303		
D08	Thursday	1:00p–3:50p	Tata 2304		

Exam	Day	Time
3/18	Wednesday	7:00p–9:59p

Office hours

Please consider office hours to be more like group study sessions or free-formed fireside chats, where we can talk about anything related to your academic and general experiences on campus. Stop by for just a few minutes or stay for the entire duration – your choice! Join us with your own questions or come and see what other students have questions about.

We have a rotating schedule that potentially allows for more people to have an opportunity to come to office hours without scheduling conflicts. Please feel free to email and set up a separate appointment if the following times do no work for you. Office hours with the instructional team will be posted on Canvas.

Campus librarians will also have dedicated office hours for our course. Please see the biology and course-specific library guides for more information: https://ucsd.libguides.com/biology

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.

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 adjust the schedule as necessary, while still focusing on learning the important concepts and laboratory skills intended for this course. Numbering for laboratory activities may also change over time. Please make sure to check Canvas each week for updated information.

Week	Topics	Laboratory Activities	Major Assignments See due dates on Canvas
1	Introduction	LB0–LB2, SL0–SL1, FW0–FW1 We will use LB0–LB1 every week!	Quiz #0
2	Beginning basics	BB0–3, SL2 Lab practical #1	---
3	Soil properties (MLK Day)	FW2, SP0–SP1, TB0–TB1	Quiz #1
4	Functional biodiversity	SP3, TB2, FB0–FB1 PS0–PS1 communication	Writing #1
5	Functional biodiversity	FB2–FB3	---
6	Genetic biodiversity	PS0–PS1 teamwork Group project, Lab practical #2	Quiz #2
7	Genetic biodiversity (Presidents' Day)	GB0–GB2	Writing #2
8	Genetic biodiversity	GB3–GB4	Quiz #3
9	Research opportunities	PS0–PS1 management Group project, Lab practical #3	Final poster submission
10	Genomic biodiversity	GB5 Writing #3 done in lab section	Quiz #4
Exam	---	---	Presentation as scheduled final

Campus Resources

If you are new to campus, check out the New Triton page: https://newtriton.ucsd.edu/

Academic Support	
Academic integrity	Policy and strategies to excel with integrity
Geisel Library	Research tools and eReserves
Learning strategies	Metacognitive support to address learning challenges
Library guide	Starting point for navigating campus library resources
REAL Portal	Internships and other hands-on experiential learning opportunities
Student Success Coaching	Peer mentor program with information, resources, and support
Technical support	Assistance with accounts, network, and technical issues
Writing Hub	Peer writing mentors and support to improve writing skills

Student resources	
Basic needs	Access to food, housing, and financial resources
Counseling and Psychological Services (CAPS)	Confidential counseling, consultations for psychiatric services, and mental health programming
Community centers	Programs for students and resources toward a socially just campus
Equity, diversity, and inclusion	Toward a campus climate of respect, fairness, and cooperation
Office for Students with Disabilities (OSD)	Support for students with disabilities, including accessibility resources and reasonable accommodations
Triton Concern Line	Support for students of concern at (858) 246-1111