

“Knowing how to think empowers you far beyond those who know only what to think.”
– Neil deGrasse Tyson

Course Information

Course Description	BILD 4 is designed to be a collaborative environment for everyone to learn together and construct a shared understanding of the material. Active participation and contribution in classes and in the laboratory are essential because many ideas and laboratory methods that will be developed in these activities cannot be easily captured otherwise. Being able to communicate understanding, articulate confusion, and defend scientific arguments based on evidence and reasoning is both useful for learning and critical to success in any discipline. To encourage collaboration and community building, many class and laboratory 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. Laboratory reports and the research proposal will challenge us to think critically about data and experiments.
Credits	2
Instructor	Prof. Keefe Reuther (Call me Dr. Keefe or Dr. K) Email address: kdreuther@ucsd.edu (please put BILD 4 in the subject line)
Synchronous Course Elements	Lectures: Tuesday 5:00pm - 6:20pm York hall 2622 (middle of Revelle campus) (all lectures will be recorded for both synchronous and asynchronous remote viewing, but lecture attendance in person is part of your grade) Labs: Your registered lab time (see next table) including some group work, some writing assignments and other assessments and projects.
Asynchronous Course Elements	Readings, some group work, some writing assignments and other assessments and projects.

Winter 2024 Lab Schedule		
Week	Lab	Due dates and quizzes
1	Ice breaker, make logo, lab intro, literature search exercise (SL) Field Trip to Reserve (Field Work FW1/Scripps Coastal Reserve Notes)	
2	Pipetting (BB1 and BB2)	Quiz #1
3	Save Soil for Genetic Biodiversity (GB1) Soil pH (SP1) set up moisture (SP2)	Writing Assignment #1 Due (Group)
4	Taxonomic Biodiversity (TB1) (if plates done) Soil moisture analysis (SP3)	Quiz #2
5	Ecoplate Setup (FB1) , Taxonomic Biodiversity (TB2)	Writing Assignment #2 Due (Individual)
6	Ecoplate Analysis and Functional Biodiversity Calculations (FB2 and FB3)	Quiz #3
7	Work on poster final project	Writing Assignment #3 Due (Individual)
8	Genomic DNA Extraction (GB2) 16s PCR (GB3)	Quiz #4
9	Gel Electrophoresis (GB4) PCR cleanup (GB5)	
10	Group Writing Assignment	Quiz #5 Writing Assignment #4 Due (Group)
Finals	Final Poster Presentation	Thursday 3/21 – 7-10pm in NSB

INSTRUCTIONAL ASSISTANTS AND LABORATORY SECTION TIMES:

Section #	Days	Time	Room	IA's
C01	W	1p-3:50p	TATA 2301	Martin
C02	W	1p-3:50p	TATA 2302	Max
C03	W	1p-3:50p	TATA 2303	Vanessa
C04	W	1p-3:50p	TATA 2304	Purushoth
C05	F	1p-3:50p	TATA 2301	Martin
C06	F	1p-3:50p	TATA 2302	Max
C07	F	1p-3:50p	TATA 2303	Vanessa

C08 F 1p-3:50p TATA 2304 Purushoth

Instructional Assistants:

<u>Name</u>	<u>email</u>
Martin	ndangvu@ucsd.edu
Vanessa	tzl001@ucsd.edu
Max	mgruber@ucsd.edu
Purushoth	pssundar@ucsd.edu

LEARNING OUTCOMES:

- Collaborate with one another to learn foundation biological concepts and laboratory skills.
- Apply knowledge of molecular biology concepts and molecular techniques to plan experiments, explain and troubleshoot results.
- Demonstrate proficiency at the basic molecular biology techniques used in the lab.
- Explain the importance of proper controls in designing experiments and interpreting results.
- Perform basic lab math skills, statistical analysis, and graphing.
- Draw conclusions based on evidence and reasoning.
- Use basic bioinformatics databases and applications.
- Find, read, and evaluate primary literature.
- Collaborate with one another to learn foundation biological concepts and laboratory skills.

CONTACT:

This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. I

The best way to contact me directly is via email: kdreuther@ucsd.edu. On all emails **PLEASE put BILD 4 in the subject line** to indicate that the email pertains to this course. If you email about anything regarding your status in the course, please include your UCSD username, and PID. Please use Piazza instead of emailing Dr. Keefe for any course content questions.

LAB MANUAL, PPE, & PROPER LAB ATTIRE:

The lab manual is required for the course. You must have your own lab coat and goggles for the course. The lab coat must be thigh length. In the lab, you must wear proper lab attire at all times. This includes close-toes shoes, socks, pants with no holes, and hair tied back. Basically, it is not safe for there to be any significant skin showing below the waist.

WEBSITE:

Everything related to the class is kept on the Canvas site (<https://Canvas.ucsd.edu/webapps/login/>). Announcements will be posted on the Canvas site. Check the site often! All grades will be posted on Canvas.

LEARNING PHILOSOPHY:

Science is like sport. Improving requires play and practice. You must experiment, take risks, think creatively, and work hard. My responsibility as your professor is to give you a space where you feel emboldened to do so. **Active participation by engaging with the lecture material, asking and answering questions, and contributing to breakout sessions during discussion time is expected.** Being able to communicate understanding, and confusion, is critical to success in any discipline, and is very useful for learning. To encourage collaboration, activities will be done in groups, and grades will not be assigned on a curve. Instead of memorization, we will focus on developing an understanding of fundamental concepts as they apply to different examples. Therefore, assignments and assessments will include questions that are based on solving problems in new contexts.

Assessment:

The general grading scheme is as follows, although it may be adjusted to improve everyone's grades if necessary. 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%		

ASSESSMENT PHILOSOPHY:

As educators in this course, our primary goal is to help you develop the mindset of a biologist rather than just memorizing their knowledge. To facilitate this, the course is designed around the learning goals outlined earlier in the syllabus. Assessment is a crucial component of this process, encompassing all tasks for which you receive feedback or grades. This enables both you and the instructional team to monitor your progress towards mastering the skills embedded in this course.

While the grading guide's eight assessment categories may appear overwhelming, each is essential for evaluating your growth as a responsible, creative, and productive scientist in the laboratory. A single final exam cannot adequately achieve this objective. Adopting a more holistic approach to feedback and grading provides a better understanding of your strengths and areas for improvement.

To help you stay organized, we recommend establishing an intentional and user-friendly system to keep track of your goals and tasks. A calendar app is an excellent starting point, ensuring that each deliverable for every class is scheduled and regularly reviewed. For notes, thoughts, and other materials, you can explore various options such as paper and pen, Apple Notes, Notion, Evernote, etc. This class will support your organization with a schedule and grading guide in the syllabus, as well as weekly announcements and module pages listing all upcoming deliverables.

Inevitably, life events can interfere with your ability to attend class or submit assignments on time. Balancing these challenges with a fair grading policy is a complex task. Here are two guiding principles that underpin our approach:

1. Life happens, and your privacy matters. Illness, family emergencies, or other unforeseen events might prevent you from completing assessments on time, and you should not be obligated to share these personal matters to your instructor or instructional assistants.
2. Grading policies have both advantages and disadvantages. While accepting late assignments could benefit many students, there are costs involved. Instructional assistants, who are often busy students themselves, need to manage their grading schedules effectively. Additionally, accepting late work after answer keys are posted is problematic. To balance these concerns, we will either drop a certain number of assignments for all students or adjust the weighting of missed assignments. This approach accommodates everyone, particularly those uncomfortable discussing their reasons for late or missed submissions.

While grades may currently be a primary focus, it's crucial to remember that once you embark on your chosen career or academic path, your skills, knowledge, motivation, and wisdom will take precedence. Focus on cultivating these attributes in each of your classes, ultimately building a solid foundation of knowledge and expertise. [Prioritizing genuine understanding over letter grades is like ascending a solid mountain instead of a sand dune - your efforts yield meaningful progress, leaving you invigorated and closer to your goals, rather than drained and no further ahead.](#)

BILD 4 Grading guide

DR. KEEFE WINTER '24

Online Weekly Canvas Quizzes - 15%

- There is a quiz every other week
- Each quiz will open Friday at 5pm PST. You will have 60 minutes and 1 attempt.
- Your lowest score will be dropped except for cumulative last quiz.
- No late or makeup quizzes - key posted the next day.

Due: Every Sunday night @
11:59pm; Weeks 2, 4, 6, 8,
10

Individual Writing Assignments - 15%

- There are two individual assignments.
- Late penalty is -2% per hour.

Due: Friday @11:59pm
Weeks 6 and 8

Group Writing Assignments - 15%

- There are two assignments.
- Late penalty is -2% per hour.
- Each group member turns in the same writing assignment separately. One is graded at random. Each person must submit to receive their grade.

Due: Friday @11:59pm
Weeks 4 and 10

Pre-lab Discussion Board - 5%

- There are 9 (week) and your lowest 2 scores will be dropped.
- No late or makeup posts.

Due: Before the beginning of
your lab time

Lab Participation - 20%

- You receive one point for showing up on-time and staying the for the whole lab.
- You receive one point for being a proactive member of the group. This includes, but is not limited to:
 - Communicating with all group mates during lab
 - Working as a unit and not dividing everything up or leaving anyone out.
 - Communicating important info to your IA
 - Following the agreed upon community norms
 - Not spending time doing things not related to BILD 4 (homework, social media)
- If you must miss a lab for a reason outside of your control, then you MUST do the following in order to receive credit:
 1. Email Dr. Keefe, before or by the beginning of lab and let him know why you can't make it.
 2. Complete a full lab makeup assignment within one week of your missed lab.

Lecture Participation - 5%

- You may miss up to 3 weeks and still receive full credit.
- You will receive 1 point for being present at the beginning of lecture and 1 point for being present at the end.

Lecture Tuesday

Lab Research Notebooks - 10%

- Your group will collectively complete 1 each week in your group's Google Doc.
- Must be completed within 48 hours of the end of lab. Usually, you will finish during the lab time.

Due: 2 days after lab

Final Poster Presentation - 15%

- Poster presentations will involve each member of the group helping with a live poster presentation during the scheduled final exam time.

Due: Final exam time

Your lab time

GROUP WORK AND PROFESSIONALISM:

A major goal of the course is to learn to collaborate with others. Unfortunately, despite best efforts and intentions, groups 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 group work as part of the university learning community. If significant disputes occur over the relative contribution of individual members of the group, please bring them up with Dr. Keefe.

Unprofessional interactions consume time yet have no meaningful benefits to you, your fellow students, and/or the teaching team. Analogously in the workplace, being unprofessional to your colleagues or supervisors will only discount you. When you are discounted, you will not be invited for new opportunities that you may or may not be aware of. Professionalism can be demonstrated through individually demonstrating maturity and professionalism, as well as contributing meaningfully to our online. By default, every student is assumed to be professionally mature. Hence, this component is awarded to every student at the beginning of the quarter. During the quarter, based on observations by the teaching team, which includes but is not limited to one-on-one interactions, electronic communication, following deadlines, and follow-up conversations on grades, your professionalism credit may be deducted.

Example interactions with meaningful benefits:

- Following the course and university rules of Academic Integrity
- Developing deeper insight into course material, concepts, biology, and/or society in general
- Working collaboratively to improve in skill building and future opportunities
- Contributing to an inclusive learning environment
- Learning conceptually and meaningfully why full credit was not awarded for an assignment
- Clarifying course material that facilitates deeper learning
- Reporting errors or problems in class, on assignments, or for other course material
- Completing the work expected of you by posted deadlines
- Keeping up with reading information distributed by the instructor and IA's

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

- Harassing and/or bullying the instructional team or other students.
- Asking questions when the information is already available or will eventually be known
- Not communicating with your group or IA when you will be absent or late. This applies both to the lab meetings and to any separate work meetings within your group.
- Editing the contribution section without proper collaboration with group members.
- Ignoring the directions or requests from the instructional team.

Additional enrollment and waitlist policies are available online (<https://biology.ucsd.edu/education/undergrad/course/waitlist.html>).

Academic Integrity Policy on the Use of Generative AI

TLDR: Generative AI is transformative for the workplace and beyond. I encourage you to embrace it, but use it wisely and ethically.

Philosophical Overview:

Generative AI 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.

Personal Responsibility and Accountability:

You own your work. AI can assist, but it shouldn't be the main contributor. If your work appears overly dependent on AI, expect an oral quiz to test your understanding. Remember: mastering AI, like any skill, takes effort. Over-relying on it shortchanges your education and has lasting consequences.

Attribution and Documentation:

Using AI-generated content? Document:

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

Include this documentation in your references/citations. It won't impact word or page limits.

Example:

Prompt for ChatGPT: "Discuss the impact of climate change on marine biodiversity."

AI's output: "Climate change has led to ocean acidification, causing coral bleaching and marine species decline."

My modifications: Added recent stats and specific species examples and I fact-checked the gen AI claims at:

How does climate change affect coral reefs? (n.d.).

<https://oceanservice.noaa.gov/facts/coralreef-climate.html>

Disclaimer on Generative AI:

Generative AI, such as LLMs, can sometimes produce misleading or false information. Be especially wary with images. You're accountable for every submission, AI-assisted or not. ALWAYS fact-check AI-generated content before submission.

Support and Resources:

Need help? Contact your instructor, IAs, or the following UC San Diego support centers:

- The Commons' Academic Achievement Hub: Learning strategies, tutoring, and supplemental instruction.
- The Commons' Writing Hub: Writing and presentation help.
- The Library: Research guidance.
- The Academic Integrity Office: Queries about ethical GenAI use.

ACADEMIC INTEGRITY:

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

Students are expected to do their own work, as outlined in the UCSD Policy on Academic Integrity. Academic misconduct is broadly defined as any prohibited and dishonest means to receive course credit, a higher grade, or avoid a lower grade. Academic misconduct misrepresents your knowledge and abilities, which undermines the instructor's ability to determine how well you're doing in the course. Please do not risk your future by cheating.

Students suspected of AI violations on exams will be invited to Zoom follow-up meetings where they will be asked to (in real time, on video) justify their answers (before the graded exams or solutions are released). If the instructor isn't convinced during the meeting, or the student refuses to participate, they're submitted for AI violations.

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](#), which serve as the foundation for academic integrity.

	As students we will.....	As the teaching team we will.....
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Honesty	<ul style="list-style-type: none"> ● Honestly demonstrate your knowledge and abilities according to expectations listed in the syllabus or in relation to specific assignments and exams ● Communicate openly without using deception, including citing appropriate sources 	<ul style="list-style-type: none"> ● Give you honest feedback on your demonstration of knowledge and abilities on assignments and exams ● Communicate openly and honestly about the expectations and standards of the course through the syllabus and in relation to assignments and exams
Responsibility	<ul style="list-style-type: none"> ● Complete assignments on time and in full preparation for class ● Show up to class on time and be mentally and physically present ● Participate fully and contribute to team learning and activities 	<ul style="list-style-type: none"> ● Give you timely feedback on your assignments and exams ● Show up to class on time and be mentally and physically present ● Create relevant assessments and class activities
Respect	<ul style="list-style-type: none"> ● Speak openly with one another while respecting diverse viewpoints and perspectives ● Provide sufficient space for others to voice their ideas 	<ul style="list-style-type: none"> ● Respect your perspectives even while we challenge you to think more deeply and critically ● Help facilitate respectful exchange of ideas
Fairness	<ul style="list-style-type: none"> ● Contribute fully and equally to collaborative work, so that we are not freeloading off of others on our teams ● Not seek unfair advantage over fellow students in the course 	<ul style="list-style-type: none"> ● Create fair assignments and exams and grade them in a fair and timely manner ● Treat all students and collaborative teams equally
Trustworthiness	<ul style="list-style-type: none"> ● Not engage in personal affairs while on class time ● Be open and transparent about what we are doing in class Not distribute course materials to others in an unauthorized fashion 	<ul style="list-style-type: none"> ● Be available to all students when we say we will be ● Follow through on our promises ● Not modify the expectations or standards without communicating with everyone in the course
Courage	<ul style="list-style-type: none"> ● Say or do something when we see actions that undermine any of the above values ● Accept the consequences of upholding and protecting the above values 	<ul style="list-style-type: none"> ● Say or do something when we see actions that undermine any of the above values ● Accept the consequences of upholding and protecting the above values

* This class statement of values is adapted with permission from Tricia Bertram Gallant Ph.D.

CAMPUS POLICIES:

- [UC San Diego Principles of Community](#)
- [UC San Diego Policy on Integrity of Scholarship](#)
- [Religious Accommodation](#)
- [Nondiscrimination and Harassment](#)
- [UC San Diego Student Conduct Code](#)

Diversity and equity statement

It is important for us to make sure that how we teach this course and how we accommodate different student needs reflects the differences of race, ability, sexual orientation, age, and gender identity that enrich our classroom experience and campus. If you have any concerns related to diversity and equity in the course, please contact the instructor.

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.

STUDENT RESOURCES:

Learning and Academic Support	
Ask a Librarian: Library Support <i>Chat or make an appointment with a librarian to focus on your research needs</i>	Writing Hub Services in the Teaching + Learning Commons <i>One-on-one online writing tutoring and workshops on key writing topics</i>
Course Reserves, Connecting from Off-Campus and Research Support <i>Find supplemental course materials</i>	Supplemental Instruction <i>Peer-assisted study sessions through the Academic Achievement Hub to improve success in historically challenging courses</i>
First Gen Student Success Coaching Program <i>Peer mentor program that provides students with information, resources, and support in meeting their goals</i>	Tutoring – Content <i>Drop-in and online tutoring through the Academic Achievement Hub</i>
Office of Academic Support & Instructional Services (OASIS) <i>Intellectual and personal development support</i>	Tutoring – Learning Strategies <i>Address learning challenges with a metacognitive approach</i>

Support for Well-being and Inclusion	
<p>Basic Needs at UCSD</p> <p>Any student who has difficulty accessing sufficient food to eat every day, or who lacks a safe and stable place to live is encouraged to contact: foodpantry@ucsd.edu basicneeds@ucsd.edu (858) 246-2632</p> <p>Counseling and Psychological Services Confidential counseling and consultations for psychiatric service and mental health programming</p> <p>Triton Concern Line Report students of concern: (858) 246-1111</p> <p>Office for Students with Disabilities (OSD)</p> <p>Supports students with disabilities and accessibility across campus</p>	<p>Community and Resource Centers Office of Equity, Diversity, and Inclusion As part of the Office of Equity, Diversity, and Inclusion the campus community centers provide programs and resources for students and contribute toward the evolution of a socially just campus (858).822-.3542 diversity@ucsd.edu</p> <p>Get Involved Student organizations, clubs, service opportunities, and many other ways to connect with others on campus</p> <p>Undocumented Student Services Programs and services are designed to help students overcome obstacles that arise from their immigration status and support them through personal and academic excellence</p>

PRIVACY PRACTICES:

(From <https://cio.ucop.edu/privacy-tips-for-your-syllabus/>)

This course is a community built on trust; as a learning community, we are collectively responsible for upholding privacy protections. In order to create a community built on trust and the most effective learning experience, our interactions, discussions, and course activities must remain private and free from external intrusion. We have obligations to each other to preserve privacy and cultivate fearless inquiry. We respect the individual dignity of all and will refrain from actions that diminish others' ability to learn.

As your instructor, I am committed to protecting your privacy by only using university-approved course technologies and adhering to the Family Educational Rights and

Privacy Act

(FERPA) <https://catalog.ucsd.edu/about/policies/notification-of-rights/index.html> and Campus Privacy Office guidelines. This includes using your educational data only as allowed by FERPA, for example, for legitimate educational purposes such as submitting your final grades to the registrar's office.

LETTERS OF RECOMMENDATION:

If you think you may want me to write you a letter of recommendation (or any other instructor), please consider what a good letter would contain and how your actions in the course demonstrate the qualities you will want highlighted in a good letter. When students ask me for a letter of recommendation, I ask them to write to me about how they demonstrated critical thinking, leadership, collaboration, and professionalism. I will be specifically looking for examples of these qualities *that I could have noticed* during lab/lecture and office hours. Be sure to actively participate in the discussions, talk to me during the lab/lecture and my office hours: ask questions, offer your own ideas and interpretations of your results, bring interesting facts/papers that are connected to the material we are studying. If you don't actively show the qualities that are needed to write a good letter, it will be hard for me to write a letter that is meaningful and useful.

Therefore, in order to ensure I am able to write substantive, insightful, and informative letters, I am only able to potentially write letters for students who fit the following criteria:

- If you are applying for an undergraduate grant/job/program:
 - You must have received at least a "B-" grade in one of my courses or be actively enrolled and passing one of my courses.
 - You must have met with me more than once outside of class (e.g. office hours/Coffee with a Prof) OR the letter is more than 2 months from being due and we can schedule at least one significant meeting.
- If you are applying for a post-graduate program (e.g. med school, post-bacc program)
 - You must satisfy ONE of the following criteria:
 - You received an "A-" or higher in one course.
 - You took more than one class with me and demonstrated clear improvement.
 - You worked with me as an Instructional Assistant or in some other professional capacity.
 - AND you must ALSO satisfy ONE of the following criteria:
 - We have met and talked multiple times in a way where I was reasonably able to assess your potential for your applied program. Examples include office hours, IA meetings, or Coffee-with-a-prof.
 - The due date for the letter is greater than one academic quarter away and you commit to meeting with me at least once to have a formal conversation.

SUBJECT TO CHANGE POLICY:

Due to unforeseen circumstances, minor aspects of this syllabus may change. This includes 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.
