UCSD BILD 1: The Cell
Lecture Schedule **Spring** 2024

Professor: **Dr. Brooke Pickett**
Professor contact: bpickett@ucsd.edu
Office Hour: M 12:30pm – 1:30pm, H&SS 1145B

Quarter start: **4/1/24**
Quarter end: 6/14/24

Overview: Welcome to BILD 1! In this class, we will develop an understanding for cellular structure and function, biological molecules, bioenergetics, the genetics of both prokaryotic and eukaryotic organisms, and the elements of molecular biology. Note that students should plan on spending **two to three hours of studying for every hour of class.** Learning anything new can be difficult at first and requires a lot of practice before you can understand it. Coming to lecture and reading through the slides is important, but it's also very important to practice the material. It will also really help to study the material as you go, since the next lecture will expand upon what was covered in the previous lecture. I know college can be stressful, so let's make sure to treat each other with patience and understanding. **We're in this together, so if you have any issues or concerns, please let me know right away.**

COURSE MEETING TIMES

The lecture and exams are fully in-person, while the discussion section is remote (see schedule below). Please look closely at the following course meeting times and the more detailed lecture schedule in this syllabus.

Lecture:

Section	Day	Time	Room
All	TTh	2pm – 3:20pm	MOS 0114

Discussion Section:

Section	Day	Time	Room
C01	W	10am – 10:50am	Remote via Zoom

IA Information: for IA office hours and location, see CANVAS.

IA Name	Email	Office Hour
Hsiang-Ying (Sophia) Lu (lead IA)	h1lu@ucsd.edu	See CANVAS
Sabrina Bennani (UGIA)	sbennani@ucsd.edu	See CANVAS
Jiehuan Liu (UGIA)	jil239@ucsd.edu	See CANVAS
Anna XI Prior (UGIA)	aprior@ucsd.edu	See CANVAS

COURSE DESCRIPTION

Required Textbook: "Campbell Biology", 12th Edition by Urry, Cain, Wasserman, Minorsky and Orr (Pearson 2021) ISBN 9780135188743. If you order directly from the publisher, the loose-leaf version of the book is $60: https://www.pearson.com/store/p/campbell-biology/P100002940947/9780135856215. You can also choose to purchase the ebook (allows you to highlight and make notes directly on the page, reads the book to you). See the **"Required Textbook Reading Schedule" below** to keep up with the course reading. If you have a different edition, that should be fine, but you may need to alter the required reading guide in the syllabus.

There is also a free Openstax Biology textbook pdf posted under the "Important Files" module in CANVAS – this is a very general source of information with limited diagrams and information, but it can be useful.

Prerequisites: prior completion of high school- or college-level chemistry course.

CANVAS: all course related information will be posted on our Canvas site. The lecture slides will be posted before lecture. Please check the Canvas site and your UCSD e-mail regularly for any announcements as these will contain essential information.

DETAILED COURSE SCHEDULE

Below is the **tentative** lecture schedule; i.e. schedule may be a little ahead or behind track as the course progresses. Review sessions are remote via Zoom and are scheduled outside of class time via a Doodle poll, they are not mandatory. The second table lists the weekly required textbook reading (reading more than what is required is highly recommended).

Week	Day	Date	Topic
1	T	Apr 2	Intro to Biology Chemistry – atomic structure
	Th	Apr 4	Chemistry – bonding, water and pH
2	T	Apr 9	Macromolecules – General info Macromolecules – carbs, lipids
	Th	Apr 11	Macromolecules – proteins, nucleic acids
3	T	Apr 16	Cell structure – cell types and endomembrane systems Cell structure – other cellular structures
	Th	Apr 18	Membranes and transport – membrane structure Membranes and transport – chemical movement and transport (*end of Exam 1 material*)
4	T	Apr 23	Metabolism – energy and enzymes
	Th	Apr 25	**Exam 1**
5	T	Apr 30	Cell communication – reception, transduction, and response Cellular respiration and fermentation overview, redox
	Th	May 2	Aerobic respiration (Glycolysis, CAC, electron transport), anaerobic respiration, fermentation
6	T	May 7	Photosynthesis – background and light reactions Photosynthesis – Calvin cycle and photorespiration (*end of exam 2 material*)
	Th	May 9	Mitosis – cell cycle and division Mitosis – checkpoints and cancer
7	T	May 14	**Exam 2**
	Th	May 16	Meiosis – general info and division
8	T	May 21	Meiosis – division (cont.), nondisjunction Genetics – Mendel's model (*end of exam 3 material*)
	Th	May 23	Genetics – nonmendelian inheritance and pedigrees
9	T	May 28	**Exam 3**
	Th	May 30	Chromosomes – linkage and X-linked traits Chromosomes – chromosome alterations
10	T	June 4	DNA replication – DNA and synthesis

	Th	June 6	Gene expression – transcription, translation Gene expression – mutations, gene expression (*end of exam 4 material*)
Finals Week	T	June 11	**Exam 4** (not cumulative), 3pm – 4:30pm

Week	Required Textbook Reading
Week 1	*Chapter 1:* "The Cell: An Organism's Basic Unit of Structure and Function" p. 6 "DNA, the Genetic Material" p. 7-8 Figure 1.8b: "Gene Expression: Cells use…" p. 8 "The Three Domains of Life" p. 12-13 Figure 1.13: "The three domains of life" p. 12
	Chapter 2: **"**Elements and Compounds" p. 29 "The Elements of Life" p. 29 "Subatomic Particles" p. 30-31 "Covalent Bonds" p. 36-37 "Ionic Bonds" p. 37-38 "Weak Chemical Interactions" p. 38-39 *Chapter 3:* "Water and Life" "Cohesion of Water Molecules" p. 45-46 "Water: The Solvent of Life" p. 49
Week 2	*Chapter 5:* "Sugars" p. 68-70 "Fats" p. 72-74 "Protein Structure and Function" p. 75, 78 Figure 5.18: "Exploring Levels of Protein Structure" p. 80-81 "The Roles of Nucleic Acids" p. 84 "Components of Nucleic Acids" p. 84-86
Week 3	*Chapter 6:* "Comparing Prokaryotic and Eukaryotic Cells" p. 97-99 "The Nucleus: Information Central" p. 102 (1st paragraph) "Ribosomes: Protein Factories" p. 102-104 (1st paragraph) "The Endoplasmic Reticulum: Biosynthetic Factory" p. 104 "The Golgi Apparatus: Shipping and ..." p. 105-106 (1st & 2nd paragraph) "Lysosomes: Digestive Compartments" p. 107 (1st paragraph) "Vacuoles: Diverse Maintenance Compartments" p. 108 "Mitochondria and Chloroplast Change Energy ..." p. 109, 110 "Roles of the Cytoskeleton: Support and Motility" p. 112, 113
	Chapter 7: "The Fluidity of Membranes" p. 128-129 Figure 7.7: "Some functions of membrane proteins" p. 130 Figure 7.9: "Synthesis of membrane components and ..." p. 131 Figure 7.16: "Review: passive and active transport" p. 137

Week 4	*Chapter 8:* "Forms of Energy" p. 144-145 "Free Energy and Metabolism" p. 148-149 Figure 8.9: "The structure and hydrolysis of…" p. 151 "Substrate Specificity of Enzymes" p. 155-156 "Catalysis in the Enzyme's Active Site" p. 156
Week 5	*Chapter 11:* "Local and Long-Distance Signaling" p. 215-216 "The Three Stages of Cell Signaling: A Preview" p. 216-217 Figure 11.8: "Exploring cell-surface…" p. 218-220 "Signal Transduction Pathways" p. 221-222 "Protein Phosphorylation and Dephosphorylation" p. 222-223 "Small Molecules and Ions as Second Messengers" p. 223 "Nuclear and Cytoplasmic Responses" p. 226 "Signal Amplification" p. 227
	Chapter 9: "The Principle of Redox" p. 165-166 "The Stages of Cellular Respiration: A Preview" p. 168 through "Fermentation and anaerobic respiration enable…" p. 180
Week 6	*Chapter 10:* "Photosynthesis feeds the biosphere" p. 188 "Chloroplasts: The Sites of Photosynthesis in Plants" p. 189 "The Two Stages of Photosynthesis: A Preview" p. 191-192 "The Nature of Sunlight" p. 192 "Photosynthetic pigments: the light receptors" first paragraph only, p. 192 "A photosystem: a reaction-center…" p. 195-196 "Linear electron flow" p. 197-198 "The Calvin cycle uses the chemical energy…" p. 201-202 Figure 10.22: "The Working Cell" p. 208
	Chapter 12: "Key roles of Cell Division" p. 235 "Cellular Organization of the Genetic Material" p. 235 "Distribution of Chromosomes during Eukaryotic Cell Division" p. 236 "Phases of the Cell Cycle" p. 237 Figure 12.7: "Exploring Mitosis in an Animal Cell" p. 238-239 "The Cell Cycle Control System" p. 244 "The Cell Cycle Clock: Cyclins and…" p. 245 "Stop and Go Signs: Internal and External Signals…" p. 246-248 "Loss of Cell Cycle Controls in Cancer Cells" p. 248
Weeks 7 and 8	*Chapter 13:* "Inheritance of Genes" p. 255 "Sets of Chromosomes in Human Cells" p. 256-257 "The Stages of Meiosis" p. 259 Figure 13.8: "Exploring Meiosis in an Animal Cell" p. 260-261 Figure 13.10: "A comparison of mitosis and meiosis" p. 263 *Chapter 15:* "Abnormal Chromosome Number" p. 307
	Chapter 14:

	“Mendel’s Experimental, Quantitative Approach” p. 270 through “The Multiplication and Addition Rules…” p. 277 “Degrees of Dominance” p. 279 “Multiple Alleles” p. 280 through “Pedigree Analysis” p. 284
Week 9	*Chapter 15:* “Correlating Behavior of a Gene’s Alleles with…” p. 295 through “Recombination of Linked Genes: Crossing Over” p. 302 Figure 15.3: “In a cross between a wild-type female fruit fly…” p. 296 “Abnormal Chromosome Number” p. 307 through “Aneuploidy of Sex Chromosomes” p. 309
Week 10	*Chapter 16:* “DNA Replication: A Closer Look” p. 322 through “Antiparallel Elongation” p. 326 “Proofreading and Repairing DNA” p. 327
	Chapter 17: “Basic Principles of Transcription and Translation” p. 337-339 “Molecular Components of Transcription” p. 342 “Molecular Components of Translation” p. 348 Figure 17.25: "A summary of transcription and translation in..." p. 356 “Types of Small-Scale Mutations” p. 357 Figure 17.27: “Types of small-scale mutations that affect...” p. 358

GRADING CRITERIA AND SCALE

The grading scale for the course is standard (see second table below). **The course assignments are not curved and the final grades are not rounded.** For example, this means a grade of 89.9% will not be rounded up to a 90%.

Assessment	**Points**
Exams	
Exam 1	100
Exam 2	100
Exam 3	100
Exam 4	100
Weekly Assignments	
Required reading quizzes (10, 2pts)	20
Practice questions (10, 3pts)	30
Study guide assignments (10, 3pts)	30
Lecture participation (16, 0.5pt)	8
Discussion section participation (10, 1pt)	10
Other	
Chemistry in Biology assignments	13
Extra Credit	3
Total for Course	**511**

Letter	**Percent**	**GPA**
A+	96-100	4.0
A	94-95	4.0
A-	90-93	3.7

B+	86-89	3.3
B	84-85	3.0
B-	80-83	2.7
C+	76-79	2.3
C	74-75	2.0
C-	70-73	1.7
D	60-69	1.0
F	<60	0

EXAMS

There will be four exams (see schedule above), none of which are cumulative (yay!). The exams are based on lecture and required reading material, they are closed-note and will be completed in-person on paper. In general, the exams will be 1.5hrs and consist of multiple choice, matching, T/F, fill-in, and short answer questions. We will have exam reviews before every test, each one will be scheduled via a Doodle poll and will take place outside of lecture hours. I highly suggest either making a study guide or digital flash cards (using the free Anki program –apps.ankiweb.net) after each lecture. This is a fast-paced course, so it is imperative to keep up with the material and the required reading. None of the exam grades will be dropped and make-up exams will only be given with a doctor's note.

REQUIRED READING QUIZZES

Quizzes will be given once a week and cover material from that week's required textbook reading. Quizzes are available on CANVAS from Friday 9am – Tuesday 12pm and can be taken any time within that window. The quizzes each contain 5 questions and must be completed within 10min of opening. Every quiz is open-note, but not open-internet (CANVAS will proctor). **Giving/receiving quiz answers to/from other students is an academic integrity violation – do not risk your future for an assignment.** At the end of the quarter, your lowest quiz grade will be dropped. There are no make-up quizzes (unless you have a doctor's note).

PRACTICE QUESTIONS

Practice questions will be posted on CANVAS each week and will pertain to the material we covered that week. Students will assist each other in the Wed discussion section by answering questions that pertain to Tuesday's lecture, but the rest of the assignment must be **completed individually**. Students should not answer questions **before they are covered** in lecture, as this will lead to incorrect answers. Answers to practice questions are due the following Tuesday at noon on CANVAS under "Assignments" > "Practice Questions". For example, the Week 1 practice questions will be due noon on the Tuesday of Week 2. If students complete all the practice questions with a strong attempt at correct answers and integrity, they will receive the full points each week. Your answers must be written in your own words, **do not copy and paste from lecture slides or other sources.** Assignments with **high Turnitin scores will not be accepted.**

STUDY GUIDE ASSIGNMENTS

Creating study guides from the lecture slides is a great way to prepare for the exams. This allows you to study the study guide, rather than going through dozens of lecture slides before the exam. Each week, you will create 10 questions and answers per lecture that we covered that week. For example, if we covered two lectures that week, you'll write 20 questions and answers in your study guide assignment. The questions must be in a **short answer format** and must relate to the **main points** from the lecture. Ask questions that you would expect to see on the exam. These cannot be recycled practice questions. This way, before the exam, you will have a study guide to study for each lecture we went over. If students complete the whole study guide assignment with a strong attempt at correct answers and integrity, they will receive the full points each week. Your questions and answers must be written in your own words, **do not copy and paste from lecture**

slides or other sources. Assignments with **high Turnitin scores will not be accepted.** Study guides are due the following Tuesday at noon of the next week. For example, the Week 1 study guide will be due noon the Tuesday of Week 2. Note: you are only required to write 10 questions and answers for each lecture, but I highly recommend writing more than that to make a more useful study guide.

LECTURE PARTICIPATION

At some point during every lecture, a simple question will be asked based on the material we just went over. Students will scan a QR code and fill out their name and answer on a Google form. The participation answers are not graded for accuracy, just completion. Students must be present in lecture the entire time to receive participation points. The lowest participation grade for lecture will be dropped at the end of the quarter to account for any Google form issues. There will be a separate "Live Q&A" Google form for each lecture (posted on CANVAS), where students can anonymously ask questions during lecture and have those questions answered by an IA. Lecture slides are available for download from CANVAS prior to the lectures and lecture recordings will also be posted to CANVAS after lecture under the "Media Gallery" tab in CANVAS. See attendance policy below for further information regarding how to report an absence, excused, and unexcused absences.

DISCUSSION SECTION PARTICIPATION

Your IA will start off discussion section with a Kahoot, Quizizz, Aha Slides, or Socrative. Students will then be divided into Zoom breakout rooms to work together on the weekly practice questions. During discussion section, only answer practice questions that have been covered in the **Tuesday lecture**, do not answer questions that have not been covered yet – this will lead to incorrect answers. The rest of the practice problems are completed individually outside of discussion section. Following group work, your IA will go over any questions or issues that arose with the practice problems. Students must be participating in discussion section the entire time to receive participation points. Participation means that students need to be able to 1) speak into their microphone, 2) share their screen, and 3) work on a collaborative document (Googledoc, sketch together, etc.). Students will be given a minute to set up a shared document link before IAs begin joining rooms. There will be a ratio of 16 student groups per IA. **All students** must submit a **screenshot of their group's work** via CANVAS under "Assignments" > "Discussion Participation" by **20min after the end** of section to receive credit. The screenshot should include: proof of any completed work and the names of all team members who were present. The lowest participation grade for discussion will be dropped at the end of the quarter to account for any submission issues. See attendance policy below for further information regarding how to report an absence, excused, and unexcused absences.

CHEMISTRY IN BIOLOGY (CIB) ASSIGNMENTS

This is an ongoing research project with the goal of giving students more practice in the fundamental chemistry topics needed to understand biological molecules: bonds, reading chemical structures, size and scale, polarity, hydrophobicity, and functional groups. The two assignments consist of: 1) a pre-quiz and demographic survey completed in week 1 or 2 and **graded on completion** (3pts) and 2) a post-quiz completed before the first exam and **graded on correctness** (10pts). For the post-quiz, students can take the quiz up to 50 times (getting slightly different questions each time). If students achieve below 90%, they receive half credit. If students achieve 90% or above, they receive full credit. There will also be optional explanatory videos and practice problems (available as an asynchronous module). **All students must complete the two assignments whether or not they consent to participate in the study.**

If you consent to participate in this study, no action is needed. However, if you do not consent to participate in this study, or you choose to opt-out at any time during the quarter, please fill out the form linked below and your assignment responses will not be included in the CIB study.

Consent to act as a research subject: Assessing the Impact of Acing Chemistry in Biology Education (AChiBE) Program

Who is conducting the study, why you have been asked to participate, how you were selected, and what is the approximate number of participants in the study?
Melinda T. Owens and Claire Meaders and their research associates are conducting a research study to find out more about how the Acing Chemistry in Biology Education (AChiBE) program affects student learning and experience in the classroom. You have been asked to participate in this study because you are a student in a class that is being studied or used as a control. There will be approximately 2000 participants in this study.

Why is this study being done?
The purpose of this study is to create knowledge that has the potential to improve the learning and educational experience of introductory biology students at UC San Diego and beyond.

What will happen to you in this study and which procedures are standard of care and which are experimental?
If you agree to be in this study, the following will happen: Your data from this class including grades, homework and exam submissions, and survey responses will be included in the analysis to determine the effectiveness of the AChiBE program used in this course compared to other similar courses.

How much time will each study procedure take, what is your total time commitment, and how long will the study last?
Your participation involves only agreeing to let us use your data in our analysis. It will require no time on your part above the time you put into this course without agreeing to the study.

What risks are associated with this study?
Participation in this study may involve some added risks or discomforts. These include the following: A potential for the loss of confidentiality. We will not share your personally identifying data with people outside our research team. Data will only be kept in anonymized form for research purposes. Course data will be rendered confidential by removing any identifiers before analysis. Your instructor will never know whether or not you are participating in this study. Data from students who opt out of the study will be removed prior to data analysis by a person on the research team who is not your instructor. Research records will be kept confidential to the extent allowed by law. Research records may be reviewed by the UCSD Institutional Review Board.

Since this is an investigational study, there may be some unknown risks that are currently unforeseeable. You will be informed of any significant new findings.

What are the alternatives to participating in this study?
The alternatives to participation in this study are not to participate. If you choose to opt-out of participating in this research study, we will exclude your data from analysis. Whether you participate will have no impact on your experience or grade in the associated class as the professor will not know who is or is not participating in the study.

What benefits can be reasonably expected?

There is no direct benefit to you for participating in the study. The investigator, however, may learn more about how to improve student learning, and society may benefit from this knowledge.

Can you choose to not participate or withdraw from the study without penalty or loss of benefits?
Participation in research is entirely voluntary. You may refuse to participate or withdraw or refuse to answer specific questions on a questionnaire at any time without penalty or loss of benefits to which you are entitled, like grades. If you decide that you no longer wish to continue in this study at any time, simply respond to the online opt-out form here: https://forms.gle/fkewm31xa4twQTXk8

You will be told if any important new information is found during the course of this study that may affect your wanting to continue.

Can you be withdrawn from the study without your consent?
The PI may remove you from the study without your consent if the PI feels it is in the best interest of the study, for example if there is incomplete data or plagiarized responses. You may also be withdrawn from the study if you do not follow the instructions given you by the study personnel.

Will you be compensated for participating in this study?
You will not be compensated for participating in this study.

Are there any costs associated with participating in this study?
There will be no cost to you for participating in this study.

Who can you call if you have questions?
Melinda Owens, Claire Meaders, or one of their associates has explained this study to you and answered your questions. If you have other questions or research-related problems, you may reach Melinda Owens at mtowens@ucsd.edu or (415) 290-8853.

You may call the Human Research Protections Program Office at 858-246-HRPP (858-246-4777) to inquire about your rights as a research subject or to report research-related problems.

Your Consent
If you consent to participate in this study, **no action is needed.** If you **do not** consent to participate in this study, or you choose to opt-out at any time during the quarter, please submit this form online at https://forms.gle/fkewm31xa4twQTXk8 . Your instructor will not have access to the list of students who opted out.

EXTRA CREDIT
There are three points of possible extra credit in this course. Extra credit assignments may take the form of student surveys or paper analysis – these assignments will be announced during class and via email. Asking for extra credit points beyond this **or asking for added points to boost your grade** is inappropriate and not in line with the ethics of academia; any requests of this nature will be dismissed.

WEEKLY CHECKLIST
Below is a helpful checklist that students can follow each week to make sure they are up to date on all tasks:

- ☐ Attend weekly lecture and discussion section

- ☐ Complete required reading after each lecture (see required reading list)
- ☐ Complete the weekly required reading quiz by Tuesday at noon
- ☐ Complete the weekly practice questions by Tuesday at noon
- ☐ Complete the weekly study guide assignment by Tuesday at noon
- ☐ Check if a Chemistry in Biology assignment is due

COURSE POLICIES

Below you will find the class policies regarding attendance, late assignments, extra credit, accommodations, and cheating.

ATTENDANCE

Lecture and discussion section attendance is required and is essential to understanding the material and performing well on the exams. If lecture is missed, students can watch the lecture podcast (via the "Media Gallery" tab in CANVAS). If you will be absent from either lecture or discussion section, **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. Please note that **missing 5 or more lecture or discussion sections** will result in a failing grade and the student **will need to drop the course**. Please see the detailed guidelines below regarding unexcused and excused absences in lecture and discussion section:

> *Unexcused absences:* will result in no participation points for that lecture/discussion. Unexcused absences include: 1) missing lecture/discussion without first notifying the professor or IA (except in medical emergencies), 2) arriving to lecture/discussion 15min late or more, 3) leaving lecture/discussion with 15min or more remaining, 4) absences due to scheduling conflicts (other coursework, vacations, planned meetings, etc.), or 5) attending a discussion section the student is not registered for.
>
> *Excused absences:* will result in full participation points for that lecture/discussion. Excused absences include feeling sick, being COVID-positive, having COVID symptoms, unexpected occurrences, or events out of the student's control. Students must let Dr. Pickett know of lecture absences and IAs know of discussion absences **ahead of time** (this excludes medical emergencies) in order for the absence to be excused.

Attendance and COVID: **DO NOT** attend lecture if you are feeling sick, have been in contact with a COVID-positive person, or are COVID-positive – please protect your fellow students, IAs, and professors. As stated above, the lecture recording can be watched remotely.

Add/drop deadlines: Deadline for all students (undergraduate and graduate students) to add or re-enroll in classes if canceled for non-payment via WebReg is Apr 12. Deadline for all students (undergraduate and graduate) to drop classes without "W" grade on transcript is Apr 26. Deadline for Undergraduate students to drop with "W" grade on transcript is May 10. For all deadlines see the Enrollment and Registration Calendar 2023-2024 on the UCSD website.

LATE ASSIGNMENTS

Late assignments are **not accepted** unless there is a doctor's note, a prior request for accommodations, or existing accommodations. If a student is struggling, it is their responsibility to seek out help and **let the**

professor know of their circumstances **before** assignments are to take place (excepting emergencies). Students cannot ask for accommodations retroactively – this includes asking for an extension for work that has already been due. It is the responsibility of the student to: write due dates down in a calendar when they are announced, start on an assignment well in advance so last minute issues (ex. Wi-Fi) are not a problem, turn in assignments on time, manage their time accordingly, and communicate with the professor in a timely manner if goals will not be met. **Time-management and effective communication** are integral skills in any professional environment.

LEARNING OUTCOMES (LOs)

1) Explain the relationship between chemical structure and function of molecules such as DNA, RNA, proteins, amino acids, and lipids.
2) Compare and contrast how the structures and elements of prokaryotic cells, eukaryotic cells, and viruses' impact how they function.
3) Predict how and when molecules may enter or exit cells through various pathways in the cell membranes.
4) Analyze how energy is produced and used by cells, including processes such as cellular respiration and photosynthesis.
5) Explain how cells receive and act on external chemical signals, including the stages of cell signaling and how signals are amplified.
6) Explain mechanisms that lead to genetic diversity including mutation and meiotic recombination.
7) Analyze how environment interacts with genotypes to produce phenotypes.
8) Explain patterns and mechanisms of inheritance.
9) Apply the central dogma to explain how genes give rise to the traits we observe in organisms.
10) Explain how gene expression can be modulated.

ACADEMIC INTEGRITY

Honesty is primarily the responsibility of each student. The College considers cheating to be a voluntary act for which there may be a reason, but for which there is no acceptable excuse. It is important to understand that collaborative learning is considered cheating unless specifically allowed for by the professor. The term cheating includes but is not limited to: plagiarism, receiving or knowingly supplying unauthorized information, using unauthorized material or sources, changing an answer after work has been graded and presenting it as improperly graded, illegally accessing confidential information through a computer, taking an examination for another student or having another student take an examination for you, and forging or altering grade documents.

If any act of academic dishonesty is observed, **the professor is required to report it.** The student will **automatically receive a zero** on that test or assignment (the grade received as a result of an academic integrity violation stays calculated into the student's GPA even if the student retakes the class). There will also be an AI Administrative Fee of $50 (posted to the student account), mandatory AI Training, at least one Disciplinary Action, and possibly other actions per the professional judgement of the Appropriate Administrative Authority (AAA). **Discipline may include probation, suspension (from a Quarter to Two Years), or dismissal.** Please do not risk your GPA and/or future career by cheating.

USE OF ARTIFICIAL INTELLIGENCE (AI)

AI technology can be used for a variety of purposes and 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. While you cannot use AI (such as ChatGPT) on

quizzes, you can use it for other assignments in the course. However, you must **always cite the AI appropriately** according to how you use it (see Case 1 or 2 below):

- Case 1: Citing when tools used ONLY for copy editing. (See below)
- Case 2: Citing when tools used in any other way. (See below)

Case 1: You have only used an online tool to improve the clarity of your writing without changing the content or information contained. This is known as **copy editing.** If anyone has done this for anything in the course (eg., lab notebook, writing assignment, etc.) this phrase **MUST** be added to the end of the assignment:

"*This assignment was edited for clarity and conciseness using [INSERT NAME OF TOOL HERE: ChatGPT, Grammarly, Copilot, Claude.ai]. I take full responsibility for all the ideas, opinions, and facts herein. I acknowledge that generative AI can not independently verify the accuracy of the information it provides and it is my responsibility to do so."*

Case 2: You have done anything else with generative AI that was used in the process of completing the assignment. This can include, but is not limited to brainstorming, and summarizing concepts. It includes any time you have received anything considered creative or scientific content from the tool. Then **the following MUST be included in your references/citations:**

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

Example:

1. *Prompt for ChatGPT: "Discuss the impact of climate change on marine biodiversity."*
2. *AI's output: "Climate change has led to ocean acidification, causing coral bleaching and marine species decline."*
3. *My modifications: Added recent stats and specific species examples and I fact-checked the gen AI claims at:*
4. *How does climate change affect coral reefs? (n.d.). https://oceanservice.noaa.gov/facts/coralreef-climate.html*

AI can assist, but it **cannot be the main contributor** to your assignment. If your work is 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. Also note that AI can sometimes produce misleading or false information. Be especially wary with images. You're accountable for every submission, AI-assisted or not.

RESOURCES FOR STUDENTS

A complete list of student resources can be found on the CANVAS homepage.

1. ***Triton Food Pantry –*** (https://basicneeds.ucsd.edu/food-security/pantry/index.html) Please **don't go hungry**! Triton Food Pantry is **free and available for any student.** The pantry has food staples such as oatmeal, canned soups, fresh produce, dry goods, and milk that students can access for **free** at Student Center A (next to The Hub) or Graduate Housing (a.k.a "OMS") on Miramar Street. For food pantry

hours, please see the above website. In general, food items are assigned a point value and **any** registered student is able to pick up 15 points worth of food per week. There is no parental salary requirement or anything like that. The Triton Food Pantry also provides a range of services including care packages, emergency food relief, basic needs events, and various pop-up locations on campus.

2. ***The Hub Basic Needs Center –*** (https://basicneeds.ucsd.edu/index.html) If you are facing challenges with access to adequate food, stable housing, or general resources, please complete this form so assistance can be provided: https://basicneeds.ucsd.edu/forms/basicneeds/index.html. The Basic Needs Center also provides free hygiene products on an emergency basis.
3. ***Office for Students with Disabilities (OSD) –*** (https://osd.ucsd.edu/) Assists students with documented disabilities (psychological, psychiatric, learning, attention, chronic health, physical, vision, hearing, brain injury) to provide accommodations in classrooms and labs. For example, if you think you may have test anxiety due to an underlying condition that interferes with your ability to learn, focus, or concentrate, OSD is a great resource. In many cases, students are entitled to assistance with test taking, such as extra time to complete a test, testing in a less distracting room or having questions read aloud. OSD's mission is to offer quality programs and services that empower students with disabilities to access and engage in educational activities at UCSD. Please notify your instructor immediately if you require special health or disability accommodations.
4. ***Counseling and Psychological Services (CAPS) –*** (https://wellness.ucsd.edu/CAPS/services/Pages/Appointments.aspx) This is an **amazing resource** staffed by **professional therapists**. If you are feeling overwhelmed by emotions or need help working through a problem, please make an appointment. For first-time appointments, you can now go directly to MyStudentChart.ucsd.edu and book an appointment online.
5. ***Dean of Student Affairs****:* The Undergraduate Colleges are available to support students who experience difficulties and **need assistance** getting connected to and navigating resources. The Office of the Dean of Student Affairs in your College works with students on connections within their College and to campus resources unique to their situation. Examples include: connecting students to appropriate resources such as academic advising and counseling, providing immediate connection to support services (Temporary Housing Protocol and/or Emergency Meal Assistance Program), helping with course issues, etc. This is what they are there for. Link: College Resources (ucsd.edu).

   Contact information:
   Revelle College: Sherry Mallory, slmallory@ucsd.edu
   Muir College: Jason Thibodeaux, jjthibodeaux@ucsd.edu
   Marshall College: Amber Vlasnik, avlasnik@ucsd.edu
   Warren College: James C. Smith, jcs004@ucsd.edu
   Roosevelt College: Mario Garibay, magaribay@ucsd.edu
   Sixth College: Diane LeGree, dlegree@ucsd.edu
   Seventh College: Josh Brimmeier, jbrimmeier@ucsd.edu
   Eighth College: Sarah Gallenberg, sgallenberg@ucsd.edu
6. ***Teaching + Learning Commons –*** (https://commons.ucsd.edu/students/academic%20support.html) Made up of six unique, but integrated hubs, The Teaching + Learning Commons provides comprehensive academic support for students. Includes tutoring, writing help, learning strategy workshops, and study groups.

7. ***The Writing and Critical Expression Hub –*** (http://commons.ucsd.edu/students/writing/index.html) provides support for undergraduates working on course papers, i.e. lab reports as well as other independent writing projects. Writing mentors can help at any stage of the writing process, from brainstorming to final polishing. The Writing and Critical Expression Hub offers: one-on-one writing, tutoring by appointment, supportive and in-depth conversations about writing, help with every stage in the writing process, walk-in tutoring, and workshops on writing.
8. ***The Office for the Prevention of Harassment & Discrimination (OPHD) –*** (https://ophd.ucsd.edu/) 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, 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, 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.
9. ***Student Organizations:*** feel more connected to your peers and campus community by joining a student club: https://studentorg.ucsd.edu/. Sort by category and find a club that works for you!
10. ***Supplemental Instruction (SI) Program:*** every week Angeline Gill (argill@ucsd.edu) will host tutoring sessions that are specifically based on our course. SI schedule: https://aah.ucsd.edu/supplemental-instruction/index.html. You can attend these sessions if you want additional practice with the course material or want to discuss the content in a group setting to supplement your learning. I strongly encourage you all to attend to discuss and learn with your peers!

OTHER TIPS

Joining a research lab

If you want to join a research lab on campus, you can! Labs will allow undergraduate students to perform certain tasks to assist with graduate student research. Some labs will even allow undergraduate students to conduct their own research. How do you find a lab you want to join? Use Real Portal (REAL Portal (ucsd.edu)), Handshake (Research Opportunities (ucsd.edu)), or the Undergraduate Research Hub (Undergraduate Research Hub (ucsd.edu)). You can even cold-email professors whose labs you are interested in joining. **You don't need prior research experience or even prior knowledge; you'll learn everything in the lab.** Full informational video: Getting into Undergraduate Research @ UCSD - YouTube.

Office hours

Office hours are a great resource if you have any questions about the course content. You can also consider office hours to be more like 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. Please feel free to email and set up a separate appointment with me if necessary. Office hours with instructional assistants will be posted on CANVAS.

College Survival Skills

- Keep a calendar of all exam/assignment due dates and appointments
- Plan on spending two to three hours of studying for every hour of class
- Be on time to class, ask questions when needed, and participate
- Take notes in class and review them often
- Complete all assignments on time
- Take advantage of services on campus to help you succeed such as tutoring
- Arrange for needed accommodations early in the term
- Visit the ACCESS office for assistance, questions, counseling, and class selection – they are here to help
- Plan time to eat, sleep and have some fun
- If trouble arises, seek assistance as soon as possible

Coping Skills for Test Anxiety

- Breathing techniques or holding something small to fidget with (like a rubber band)
- Reframing thoughts: believing in yourself and remembering this is just one exam
- Doing the hardest questions (like short answer) first so you can relax a little bit
- Studying as you go, instead of all at once
- Studying in a place that is relaxing or familiar
- Making a routine - maybe adding a few questions to a study guide right after each lecture. Routine tends to decrease stress.
- Having breakfast and water (no coffee) right before a test

Self-Advocacy Tips

- Understand my disability and learn ways to compensate
- Learn how to explain my disability and needs to others
- Learn how to ask for appropriate accommodations
- Learn that it is OK to use appropriate accommodations
- Identify my strengths and weaknesses
- Learn that it is OK to ask for help
- Express my needs clearly to all college employees, especially the ACCESS staff and my instructors, early in the term
- Take responsibility and develop independence in coordinating my services
- Meet with instructors when needed

*** This syllabus is subject to change. Any changes will be announced in class and on CANVAS. Students will be responsible for all changes.