

OCEA 1: The Oceans

Katlin Bowman, PhD
Summer 2024

COURSE INFORMATION

Course design: This is an online, asynchronous course with no scheduled meeting times. Asynchronous work will be completed in [Connect](#) and lecture videos posted in [Canvas](#) can be watched at any time.

Course description: An interdisciplinary introduction to oceanography focusing on biological, chemical, geological, and physical processes. Covers topics such as origins and structure of planet Earth and its oceans, co-evolution of Earth and life, plate tectonics, liquid water and the hydrologic and hydrothermal cycles, salinity and elemental cycles, ocean circulation, primary production and nutrient cycles, plankton and nekton, life on the sea floor, near shore and estuarine communities, future environmental problems our oceans face. Students may also enroll in and receive credit for EART 1.

INSTRUCTOR INFORMATION

Katlin Bowman, PhD

Pronouns: she/her

klbowman@ucsc.edu

Instructor Biography: Dr. Bowman has a B.S. and Ph.D in Environmental Sciences from Wright State University (Dayton, Ohio). She has worked in the Ocean Sciences Department at UCSC since 2015 as a researcher and lecturer. Katlin is recognized as an expert in the field of mercury biogeochemistry and has completed several projects investigating marine plastic debris for the [National Geographic Society](#). Recently, she spent six weeks in the Clarion Clipperton Zone of the Pacific Ocean, working with a team of independent scientists to measure the environmental impacts of a pilot deep-sea mining operation.

Teaching Assistant

Aubrey Trapp

ajtrapp@ucsc.edu

Biography: Aubrey is a Ph.D. student in the Ocean Sciences department at UCSC. She is interested in plankton dynamics with special focus on marine chemical ecology and harmful algal blooms. Aubrey completed an M.S. in marine science at the University of Gothenburg and a B.S. in biochemistry at the University of Texas at Austin. Her previous research projects include evaluating the use of copepod cues in predicting biotoxins from harmful algal blooms on the Swedish west coast and characterization of ciguatoxins in Caribbean fish at the UK Centre for Environment, Fisheries, and Aquaculture Science.

LEARNING OUTCOMES

Learning objectives:

- Explain and use seafloor plate tectonics to predict future plate motions and interactions.
- Explain the criteria for the origin of the Universe, Solar System, Earth, oceans and atmospheres in terms of the Big Bang Theory, Red-Shift calculations, nuclear fusion, supernovae, and volcanic outgassing.
- Describe major ocean algae and animal phyla including planktonic organisms.
- Navigate with the use of a sextant and chronometer to determine the latitude and longitude.
- Identify sources of marine pollution.
- Explain the relationship between air masses, ocean waves, wind belts and ocean surface current flow.
- Explain the Equilibrium Theory of Tides in terms of Newton's law of gravity and the centrifugal force.
- Interpret paleomagnetic data to explain reversals of earth's magnetic field and age of the seafloor.
- Use some of the physical properties of seawater, such as density, turbidity, sound travel, and salinity, to explain seawater flux in ocean basins and how that flux is related to global climate, and marine ecology.
- List the major chemical constituents that determine ocean salinity and explain the origin of these constituents.

Student Learning Outcomes:

- Display a wide range of ocean literacy with specifics such as marine ecosystems in biological oceanography, heat capacity and density for physical oceanography, ions and salinity for chemical oceanography, and plate tectonics for geological oceanography.
- Differentiate between sources of ocean sediment and the constituents of seawater salinity and demonstrate how oceanographers analyze these materials using fundamentals of physics and chemistry.
- Use the Principles of Plate Tectonics to explain how they affect ocean basin shape and features.

REQUIRED MATERIALS, TEXTBOOKS AND TECHNOLOGY

- **Textbook:** Investigating Oceanography, 3rd Edition w/Connect Code (ISBN: 9781264012824)
 - YOU MUST PURCHASE A CONNECT CODE! This course uses Connect for graded SmartBook assignments and quizzes.
 - Purchasing a Connect code gives you access to an electronic version of the textbook, a hardcopy of the textbook is optional.
- **Canvas:** This course is hosted on [Canvas](#). You do not need to sign up for an account, login with your CruzID and Gold Password at canvas.ucsc.edu. See [Canvas Getting Started Student Guide](#).
- **Google Docs:** Homework assignments will be completed using Google Docs. These assignments are provided through Canvas and can be stored in your [Google Drive](#), which is accessible through your UCSC email account.
- **YouTube:** Lecture videos are hosted on YouTube and require an internet connection to view.
- **Zoom:** Optional office hours for this class will be held on [Zoom](#).

COMMUNICATION

During this session we will communicate primarily through Canvas announcements and Zoom office hours, with some email communication. Please sign up for [Canvas notifications](#) and check your email frequently to stay informed.

Post general questions on the “ASK Questions Here” discussion board in Canvas. General questions include

- questions about course material (i.e. What is the difference between prokaryotic and eukaryotic cells?),
- course navigation (i.e., Where do I find the group project discussion board?),
- due dates, course schedule, etc.

These are questions likely shared by other students in the course; posting responses on a public discussion board gives you answers faster that can be shared with the whole class. I will respond to discussion board questions within 24 hours M-F.

Private inquiries (i.e., missing class due to family emergencies, DESP services, grade concerns) should be made through email only (klbowman@ucsc.edu) and not posted on discussion boards. I will respond to emails within 24 hours M-F and generally do not respond on the weekends.

Office Hours with Katlin

Tuesdays 6:00 - 7:00 PM (or by appointment, schedule through email)

Zoom link for office hours:

<https://us05web.zoom.us/j/86034988818?pwd=hHsILR0AIsY5EwUB6sMtrxEksaktSz.1>

Meeting ID: 860 3498 8818

Password: bluewhale

Office Hours with Aubrey

Friday 10:00 AM- 11:00 AM (or by appointment, schedule through email)

Zoom link for office hours:

<https://ucsc.zoom.us/j/3736496445?pwd=TkVwU016K21qNkNTZDh1UWZPRmJtUT09>

Meeting ID: 373 649 6445

Passcode: 327235

ASSIGNMENTS & ASSESSMENT

Introduction to new material in this course comes from textbook reading assignments, SmartBook practice assignments, and video lectures.

- Each week you are assigned to read 2-4 chapters from your textbook.
- After or during your readings, you must complete SmartBook assignments in Connect. SmartBook assignments are low-stakes reading quizzes, designed to improve your understanding of the text. If you get a problem incorrect you will not lose points, and instead will be assigned additional questions on the same concept to try again. Points are awarded for completing SmartBook assignments (not for correct answers).
 - Each SmartBook assignment is worth 10 points.
 - Time estimates for each SmartBook assignment are listed in Connect.
- Each week includes several video lectures on topics covered in the readings. Videos are 5-20 minutes in length and can be watched at any time. Each module contains a PDF of lecture slides to use as notes.

Initial assessments include worksheets and quizzes in Connect.

- Each week you will complete a worksheet to challenge your understanding of new material. Worksheets include calculations, examination of real oceanographic data, online simulations, charts and maps. The worksheet is provided as a Google Doc and submitted through Canvas.
 - Each worksheet is worth 25 points.
- Every module contains 1 quiz that you will take in Connect. It is recommended that you complete reading and SmartBook assignments, and watch video lectures before taking the quiz. You may use your notes and textbook while taking the quizzes.
 - Each Connect quiz is worth 10 points.
 - Quizzes contain 10-15 questions.

Final assessments are Canvas exams.

- Two exams will be taken in Canvas for this course (the second exam is NOT a comprehensive final exam). Exams will include mostly multiple choice questions, with some short answers, fill in the blank, and essay questions. Exams are timed (2.5 hours to complete), you may use your notes and textbooks, but you must work alone. An online review activity will be provided to help you prepare for each exam.
 - Each exam is worth 150 points.

GRADING POLICY

If you miss an assignment or due date, you must communicate with your instructor within 24-48 hours to turn in late work.

- Points will be deducted (-10% per day) for late assignments including SmartBook assignments, Connect quizzes, worksheets, and discussion posts. Assignments are designed to help you prepare for exams; if the exam covering material from a missed assignment has passed, that assignment can no longer be turned in.
- Make-up exams are only available under extenuating circumstances. Send Katlin an email (klbowman@ucsc.edu) to arrange for a make-up exam. If you forget to take an exam, you will NOT be given a make-up exam and will receive a 0. Enter important due dates in a calendar or planner at the beginning of the session to stay on track.

Points breakdown and due dates

Assignment	Number of assignments	Due dates	Weight	Total points
SmartBook Assignments	10 (10 points each)	Assigned weekly, due Sunday nights by 11:59 PM	16%	100
Connect Quizzes	10 (10 points each)	Assigned weekly, due Sunday nights by 11:59 PM	16%	100
Worksheets	5 (25 points each)	Assigned weekly, due Sunday nights by 11:59 PM	20%	125
Exams	2 (150 points each)	Exam 1: July 14 Exam 2: July 26	48%	300
Total				625

Course Grading Ranges

100–97 = A+	76.9–73 = C
96.9–93 = A	72.9–70 = C-
92.9–90 = A-	69.9–67 = D+
89.9–87 = B+	66.9–63 = D
86.9–83 = B	62.9–60 = D-
82.9–80 = B-	<60 = F
79.9–77 = C+	

INSTRUCTOR FEEDBACK

Grades for this course can be viewed at any time in Canvas. Points for SmartBook assignments and Connect quizzes will update automatically in Canvas. Feedback on worksheets can be viewed in Canvas within 1 week of submission. Multiple choice questions on Canvas exams will be graded automatically (you will see your score for these questions when you submit your exam). Short-answer and essay questions will be graded by your instructor and/or teaching assistant within 48 hours of submission. Feedback on these questions will be posted in Canvas as comments. [Please click here to learn how to access my comments in Canvas.](#)

STUDENT FEEDBACK

At the end of the session you will be asked to complete a Student Experience of Teaching survey for this course. SETs provide an opportunity for you to give valuable feedback on your learning that is honest and constructive. This anonymous feedback will help me consider modifications to the course that will help future students learn more effectively.

COURSE SCHEDULE

Week	Reading topics	Important dates
One	Module 1: The Water Planet (Chp.1) Module 2: Earth Structure and Plate Tectonics (Chp.2)	Modules 1-2 due Sunday June 30 by 11:59 PM
Two	Module 3: The Seafloor and Marine Sediment (Chp.3) Module 4: Physical Properties of Water and Chemistry of Seawater (Chp.4-5)	Modules 3-4 due Sunday July 7 by 11:59 PM Drop date: Monday July 1
Three	Module 5: Atmosphere and Ocean Circulation (Chp.6-7) Module 6: Waves and Tides (Chp.8-9)	Modules 5-6 and Exam 1 due Sunday July 14 by 11:59 PM Last day to request a “W” grade Sunday July 14
Four	Module 7: Coasts, Beaches, and Estuaries (Chp. 10) Module 8: The Living Ocean (Chp.11-12)	Modules 7-8 due Sunday July 21 by 11:59 PM
Five	Module 9: Nekton and Benthos (Chp.13-14) Module 10: Marine Pollution and Climate Change (Chp.15-16)	Modules 9-10 and Exam 2 due Friday July 26 by 11:59 PM

ACADEMIC INTEGRITY

All members of the UCSC community benefit from an environment of trust, honesty, fairness, respect, and responsibility. You are expected to present your own work and acknowledge the work of others in order to preserve the integrity of scholarship.

Academic integrity includes:

- Following exam rules
- Using only permitted materials during an exam
- Viewing exam materials only when permitted by your instructor
- Keeping what you know about an exam to yourself
- Incorporating proper citation of all sources of information
- Submitting your own original work

Academic misconduct includes, but is not limited to, the following:

- Disclosing exam content during or after you have taken an exam

- Accessing exam materials without permission
- Copying/purchasing any material from another student, or from another source, that is submitted for grading as your own
- Plagiarism, including use of Internet material without proper citation
- Using cell phones or other electronics to obtain outside information during an exam without explicit permission from the instructor
- Submitting your own work in one class that was completed for another class (self-plagiarism) without prior permission from the instructor.
- Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript. For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the [Academic Misconduct page](#) at the [Division of Undergraduate Education](#).

ACCESSIBILITY

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by email, preferably within the first two weeks of the quarter. At this time, I would like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact the DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.

You can find further examples of accessibility and inclusivity statements in [CITL's Sample Syllabus Language](#).

RELIGIOUS ACCOMMODATION

UC Santa Cruz welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request the reasonable accommodation for religious practices. The instructor will review the situation in an effort to provide a reasonable accommodation without penalty. You should first discuss the conflict and your requested accommodation with your instructor early in the term. You or your instructor may also seek assistance from the [Dean of Students office](#).

PRINCIPLES OF COMMUNITY

The University of California, Santa Cruz expressly prohibits students from engaging in conduct constituting unlawful discrimination, harassment or bias... [More here](#). I am committed to providing an atmosphere for learning that respects diversity and supports inclusivity. We need to work together to build this community of learning. I ask all members of this class to:

- be open to and interested in the views of others
- consider the possibility that your views may change over the course of the term
- be aware that this course asks you to reconsider some "common sense" notions you may hold
- honor the unique life experiences of your colleagues
- appreciate the opportunity that we have to learn from each other
- listen to each other's opinions and communicate in a respectful manner

- keep confidential discussions that the community has of a personal (or professional) nature
- ground your comments in the texts we are studying. Refer frequently to the texts and make them the focus of your questions, comments, and arguments. This is the single most effective way to ensure respectful discussion and to create a space where we are all learning together.

TITLE IX/CARE ADVISORY

UC Santa Cruz is committed to providing a safe learning environment that is free of all forms of gender discrimination and sexual harassment, which are explicitly prohibited under Title IX. If you have experienced any form of sexual harassment, sexual assault, domestic violence, dating violence, or stalking, know that you are not alone. The Title IX Office, the Campus Advocacy, Resources & Education (CARE) office, and Counseling & Psychological Services (CAPS) are all resources that you can rely on for support.

Please be aware that if you tell me about a situation involving Title IX misconduct, I am required to share this information with the Title IX Coordinator. This reporting responsibility also applies to course TAs and tutors (as well to all UCSC employees who are not designated as “confidential” employees, which is a special designation granted to counselors and CARE advocates). Although I have to make that notification, you will control how your case will be handled, including whether or not you wish to pursue a formal complaint. The goal is to make sure that you are aware of the range of options available to you and that you have access to the resources you need.

Confidential resources are available through [CARE](#). Confidentiality means CARE advocates will not share any information with Title IX, the police, parents, or anyone else without explicit permission. CARE advocates are trained to support you in understanding your rights and options, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more. You can contact CARE at (831) 502-2273 or care@ucsc.edu.

In addition to CARE, these resources are available to you:

- If you need help figuring out what resources you or someone else might need, visit the [Sexual Violence Prevention & Response \(SAFE\) website](#), which provides information and resources for different situations.
- [Counseling & Psychological Services \(CAPS\)](#) can provide confidential counseling support. Call them at (831) 459-2628.
- You can also report gender discrimination and sexual harassment and violence directly to the University’s [Title IX Office](#), by calling (831) 459-2462 or by using their [online reporting tool](#).
- Reports to law enforcement can be made to the UC Police Department, (831) 459-2231 ext. 1.
- For emergencies, call 911.

DIFFICULT CONVERSATIONS

In our in-class and online discussions and dialogues, we will have the opportunity to explore challenging, high-stakes issues and increase our understanding of different perspectives. Our conversations may not always be easy. We sometimes will make mistakes in our speaking and our

listening. Sometimes we will need patience or courage or imagination or any number of qualities in combination to engage our texts, our classmates, and our own ideas and experiences. We will always need respect for others. Thus, an important aim of our classroom interactions will be for us to increase our facility with difficult conversations that arise inside issues of social justice, politics, economics, morality, religion, and other issues where reasonable people often hold diverse perspectives. This effort will ultimately deepen our understanding and allow us to make the most of being in a community with people of many backgrounds, experiences, and positions.

STUDENT SERVICES

[Counseling and Psychological Services](#)

Many students at UCSC face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

[Student Success and Engagement Hub](#)

The Division of Student Success provides campus-wide coordination and leadership for student success programs and activities across departments, divisions, the colleges, and administrative units.

[Tutoring](#) and Learning Support

At Learning Support Services (LSS), undergraduate students build a strong foundation for success and cultivate a sense of belonging in our Community of Learners. LSS partners with faculty and staff to advance educational equity by designing inclusive learning environments in Modified Supplemental Instruction, Small Group Tutoring, and Writing Support. When students fully engage in our programs, they gain transformative experiences that empower them at the university and beyond.

[Slug Support Program](#)

College can be a challenging time for students and during times of stress it is not always easy to find the help you need. Slug Support can give help with everything from basic needs (housing, food, or financial insecurity) to getting the technology you need during remote instruction.

To get started with SLUG Support, please contact the [Dean of Students](#) Office at 831-459-4446 or you may send us an email at deanofstudents@ucsc.edu.

Slug Help/[Technology](#)

The ITS Support Center is your single point of contact for all issues, problems or questions related to technology services and computing at UC Santa Cruz. To get technological help, simply email help@ucsc.edu.

On-Campus Emergency Contacts

Slug Help/[Emergency Services](#). For all other help and support, including the health center and emergency services, start [here](#). Always dial 9-1-1 in the case of an emergency.