

Course Syllabus and Policies

Course Description: An introduction to chemical compounds and their biogeochemical cycles in the oceans and atmosphere, with emphasis on climate issues like ocean acidification, greenhouse gases and the carbon cycle, other biogeochemical cycles, chlorofluorocarbons and the ozone hole, urban pollutants and their photochemistry, and aerosol particles and their effects on clouds.

Prerequisites: CHEM 6C or CHEM 6CH and MATH 20C or MATH 31BH or consent of instructor.

Textbook: Atmospheric topics in this course (Instructor: Russell) use Jacob 2000 **Introduction to Atmospheric Chemistry**, available for purchase on Amazon and for free online at <http://acmg.seas.harvard.edu/publications/jacobbook/index.html>. A reference for ocean topics in this course (Instructor: Dickson) is provided by Pilson 2013 **An Introduction to the Chemistry of the Sea**, which is available electronically from UCSD library at <http://roger.ucsd.edu/record=b7698629~S9>.

Lecture Schedule (this will be updated during the quarter):

Date	Dy	Ins.	Ch	Lectures and Topics
31-Mar	1a	Tu	A&L	Overview: Why study Oceans and Atmosphere together?
2-Apr	1b	Th	LR 7	Greenhouse Gases and their Effects
7-Apr	2a	Tu	LR 10	Stratospheric Ozone
9-Apr	2b	Th	LR 10	The Ozone "Hole"
14-Apr	3a	Tu	AD	Introduction to Chemistry in the Oceans
16-Apr	3b	Th	AD	What Controls the Distribution of Elements in the Oceans?
21-Apr	4a	Tu	LR 11	Oxidants
23-Apr	4b	Th	LR 11	Tropospheric "Cleaning" (and Review)
28-Apr	5a	Tu	AD	The Ocean CO ₂ System
30-Apr	5b	Th	A&L	Midterm Exam
5-May	6a	Tu	AD	Nutrient Stoichiometry & the Redfield Ratio
7-May	6b	Th	AD	The Importance of Micronutrients
12-May	7a	Tu	AD	Anthropogenic Carbon in the Oceans
14-May	7b	Th	AD	Ocean Acidification
19-May	8a	Tu	LR 12	Ozone Budgets
21-May	8b	Th	LR 12	Controlling Ozone
26-May	9a	Tu	LR 8	Aerosols
28-May	9b	Th	LR 8	Application: Climate Engineering (Sunlight Reflection Methods)
2-Jun	10a	Tu	AD	Geoengineering the Oceans (Iron Fertilization and other Schemes)
4-Jun	10b	Th	A&L	REVIEW

Assignments and Exams: These are listed in the course summary, but this list is not complete and will be updated. Check back here and on the online syllabus to find new updates. The midterm will be given as listed in the Schedule above.

Scanning App: If you want to write your homework and exams on paper rather than using a text editor, you will need a way to scan and post that information. There are many free scanning apps for cell phones, e.g. GeniusScan <https://thegrizzlylabs.com/genius-scan>. It is easy to use, allows students to make multi-page pdfs, and can automatically apply color and perspective corrections. The scan results can be saved and uploaded directly to Canvas.

Messaging the Instructors: To enable the Instructors to prioritize responding to your messages, please send messages from the Canvas messaging system whenever possible.

Grading Scale:

- 90 – 100% A
- 80 – 89% B
- 70 – 79% C
- 60 – 69% D
- 0 – 59% F

Grade Dissemination: Graded tests and materials in this course will be returned individually. You can access your scores at any time on TritonEd.

Late Work Policy: There are no make-ups for quizzes or exams. I do not accept late work. TritonEd is configured to accept completed assignments up to the midnight of the due date and then it will not accept submissions. I will share complete information on assignments to allow ample time for completion if you do not procrastinate. Please respect the time of your instructors and your colleagues; plan ahead and submit on time so that we can all progress through this learning experience together.

Grades of "Incomplete": The current university policy concerning incomplete grades will be followed in this course. Incomplete grades are given only in situations where unexpected emergencies prevent a student from completing the course and the remaining work can be completed the next semester. Your instructor is the final authority on whether you qualify for an incomplete. Incomplete work must be finished by the end of the subsequent quarter or the "I" will automatically be recorded as an "F" on your transcript.

Disability Access: Students requesting accommodations for this course due to a disability must provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD), which is located in University Center 202 behind Center Hall. Students are required to present their AFA letters to Faculty (please make arrangements to contact me privately) and to the OSD Liaison in the department in

advance so that accommodations may be arranged. Contact the OSD for further information: 858.534.4382 (phone); osd@ucsd.edu(email); <http://disabilities.ucsd.edu>[Links to an external site.](#) (website).

Title IX Compliance: The University recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will NOT be tolerated. If you have been the victim of sexual misconduct, physical and/or psychological abuse, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct, physical and/or psychological abuse, I must report the matter to the Title IX Coordinator. Should you want to speak to a confidential source you may contact the Counseling Center. The Office for the Prevention of Harassment & Discrimination (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>[Links to an external site.](#). 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>[Links to an external site.](#) or Counseling and Psychological Services (CAPS) at (858) 534-3755 or <http://caps.ucsd.edu>[Links to an external site.](#). Students may feel more comfortable discussing their particular concern with a trusted employee. This may be a student affairs staff member, a department Chair, a faculty member 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.

Online "Attendance" Policy: All students are responsible for all information and updates provided in all scheduled lectures, which will also be posted online whenever possible. Our expectations for your virtual and mental attendance of class is that you be prepared, engaged, and “present” for all discussions or activities. Illness, wifi problems, and unforeseen circumstances may prevent you from attending one or more classes during the quarter. Automated recordings have been scheduled, but they do not always work perfectly. If you have questions, please ask them in office hours (by zoom) or write to us using the Canvas messaging system.

Professionalism Policy: I expect the classroom to be an active, open environment, which encourages diverse thought and comments. Please attend to all university policy and classroom etiquette procedures. Those not heeding the policies will be asked to leave the classroom/lab immediately so as to not disrupt the learning environment. Please arrive on time, be attentive, and respectful for all class meetings. Students who habitually disturb the class by talking, arriving late or other unprofessional behavior may suffer a reduction in their final class grade. Active, positive, engaging, participation in class activities is essential. As pre-professionals or professionals, you should be at the point in your career where you have learned to ask and answer these questions:

1. How do I know when I know something? What is the evidence and how reliable is it?
2. How are things, events, theories, models or people connected? What is the cause and effect?
3. What is new and what is old - have I run across this idea before? When, where, what did it mean to me then, and how I can expand and further connect the concept now?
4. So what? Why does it matter? What does it all mean?

Academic Conduct Policy: The Policy on Integrity of Scholarship aims to encourage and maintain the highest ethical standards in research. The policy reaffirms the University's commitment to integrity: Integrity is essential for an academic community. The University expects that both faculty and students 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 to whom it is assigned, without unauthorized aid of any kind. Instructors, for their part, will exercise care in planning and supervising academic work, so that honest effort will be upheld. It is against policy to submit the same paper for credit in more than one course.

Instructor Goals. At a minimum, we hope to pursue the following goals and solicit your open and timely feedback on how well we are meeting these goals:

- Communicate effectively and frequently;
- Be enthusiastic, active and involved in learning;
- Demonstrate a mastery of the discipline;
- Relate material to current practice and research;
- Clearly explain complex concepts and ideas;
- Provide a framework for lifelong learning;
- Strive to involve participants in class activities;
- Be available to assist participants in or out of class; and

- Have respect and concern for all participants.