Meeting Times: TBA

Course Instructors: J. Kirk Cochran, Professor, SoMAS, Mary Scranton, Professor, SoMAS

Instructor contact information:
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Office Hours: TBA or by appointment.

Course Description: This course presents an overview of chemical oceanography. Topics include origin and history of seawater, major and minor constituents, dissolved gases, the carbon dioxide system, distribution of properties in the world ocean, isotope geochemistry, marine organic geochemistry and sediment diagenesis.

As a consequence of the topics covered, the course addresses a fundamental aspect of the SoMAS mission, namely to increase our fundamental understanding of the oceans and atmosphere and their interactions and to accomplish this via an interdisciplinary approach to .... graduate education.

Prerequisite: Enrollment in MAS program or permission of instructor

Advisory prerequisite: MAR 508

Spring, 3 credits, Letter graded (A, A-, B+, etc.)

Course Learning Objectives:

● Understand the chemical, physical, geological and biological processes that interact to control ocean chemistry

● Learn how various types of chemical species are measured and how data can be interpreted to understand ocean processes
Examine specific biogeochemical processes in depth (choice of topics to be based in part on student interest)

These objectives will be met through participation in lectures, reading assigned course material, completing homework problems and preparing and presenting a paper.

**TOPICS**

Introduction/Course Organization/Overview (P- 1)  
Geochemical Mass Balances (P- 4, 13; E&H- 2)  

Nutrient Cycling (P- 8; E&H- 6)  

Global Carbon Cycle (P-11)  

Trace Metals (P- 9)  

Journal Club  
Carbonate Chemistry (P- 4; E&H- 4)  
Carbonate Chemistry (contd.)  
Stable Isotopes (E&H- 5)  
Stable Isotopes (contd.)  
Radioactive Isotopes (P- 10; E&H- 5)
Course requirements: There will be 2 essay-style exams. Although the exams will primarily test your understanding of the material covered in lecture and reading during the immediately preceding part of the course, you are expected to apply concepts and facts covered early in the semester to later portions of the course. There will also be very short quizzes covering the reading material.

A series of homework problems will be assigned throughout the semester. These will be graded (generally on a 10 point scale), but completion of homework will be more important in affecting your course grade than the score on the homework itself. We want you to spend time THINKING about the concepts and getting practical experience manipulating equations etc. In particular, if your course grade is on the dividing line between two grades, say B+/A, we will look at whether you have made an honest effort on the homework (attempted all) in assigning a final grade.

We have also scheduled several “Journal Club” sessions throughout the course. We will use these to read and discuss a few recent papers covering the cluster of preceding topics. These will be student-led.
The final component of the grade will be a written paper (~10 pages in length) and an oral presentation of the paper near the end of the semester. More information on this will be provided as the semester develops.

Text and Other Reference Material: We will use material principally from the following texts (Designations in the lecture schedule refer to text and chapter, P = Pilson, E&H = Emerson & Hedges, and chapter numbers):

- Pilson, *Introduction to the Chemistry of the Sea* (2d edition)
- Emerson & Hedges, *Chemical Oceanography and the Marine Carbon Cycle*

and will draw on additional texts as needed. These include:

- Libes, *Marine Biogeochemistry*
- Sarmiento & Gruber, *Ocean Biogeochemical Dynamics*
- Krishnaswami & Cochran, *U- and Th-Series Radionuclides in Aquatic Systems*
- *Treatise on Geochemistry*

We will supply PDFs of relevant material as needed.

Americans with Disabilities Act: If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, contact the staff in the Disabled Student Services (DSS) office, Room 128, Educational Communications Center, 632-6478 or 632-6749/TDD. DSS will review your concerns and determine, with you, what accommodations are necessary and appropriate. All information and documentation of disability is confidential.

Academic Integrity: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person’s work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the Academic Judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges and property of other people. Faculty are required to report to the Office of Judicial
Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students’ ability to learn.