

Chemical Oceanography (CHEM 458 - GEOL 458)

Instructor: Dr. Dionysis Foustoukos (dfoustou@gmu.edu, dfoustoukos@ciw.edu)
(240-27-5646)

Office hours: Before/after class, Exploratory Hall 1005

Course Times: Friday 10:30 – 13:10, Exploratory Hall 1005

Reference Textbook: *Exams will be based on lecture presentations, homework sets, and referenced publications/notes.*

- Kennett, J.P., 1982. Marine Geology. Prentice-Hall, Inc., 813 p.
(George Mason University Fenwick Stacks (QE39.K46))
- Millero, F.J., 2006. Chemical Oceanography. Taylor& Francis Group, Boca Raton, FL, 496 p.
(George Mason University Fenwick Stacks (GC111.2.M55 1996))

Additional material from journal articles in peer reviewed publications and lecture notes will be distributed in class. Lecture readings will be posted on Blackboard.

Course Description: The course will begin with a discussion of the origin and distribution of the major and minor components in seawater, including inorganic and organic species. We will focus our sessions in linking oceanic processes to Earth-shaping events with links to climate evolution. The process discussions will include ion-seawater interactions, conservative and non-conservative species, atmospheric and dissolved gases, CO₂/carbonate chemistry, nutrients and primary productivity, photochemical processes, and hydrothermal vent chemistry.

Tentative Schedule – Structure of the Class: (Prior to each lecture I will be giving you reading assignments and lecture’s slides that would help us work on in-class exercises/lab sections):

Date:	Topic Overview
08/27	Introduction-Ocean Exploration/Historical Prospective
09/03	Heat transfer to the Oceans - Hurricanes
09/10	Ocean Circulation
09/17	Seawater

09/24	Transfer of CO ₂ , O ₂ and N ₂ from atmosphere to the oceans
10/01	Carbonates and Oceans - Homework#1 due
10/08	Mid-term#1 – Take home exam
10/15	The cycling of micronutrients C/N/P/S - Primary & Secondary Production
10/22	Primary and Secondary Productivity
10/29	The Carbon Pump
11/05	Deep Sea Life and Oceans - Homework#2 due
11/12	Tracing Oceanic Water Age
11/19	Mid-term#2 - Homework#3 due
12/03	Oceans and Climate - Final Exam Preparation - Homework#3 due

Dates of Importance:

Sept. 7	Last day to drop/add class with no tuition liability
Sept 27	Final Self-Withdrawal Deadline
Oct. 8	Signing up for “paper presentations”
Nov. 26	Thanksgiving Recess
Dec. 08-15	Final Exam

Structure of the Lecture:

- 10:30 – 11:30 Lecture
- 11:30 – 11:45 Break
- 11:45 – 13:10 Lecture and Lab demonstrations

Grading:	Two Mid-term exams (take home)	20% each
	Homework (3 in a total of 4; the one with the lowest score will be dropped)	10% each
	Paper presentation	10%
	Final exam (take home)	20%

PLAGIARISM: Plagiarized assignments will be graded as “F”.

Exams: Exams will be based on lecture presentations and homework sets. In general, you would be asked to read 1-2 scientific papers and respond to questions – turnaround time: 1 week.

Homework: A total of 3 homework assignments. This will include readings, written assignments and calculations to be completed outside of class.

Paper presentation: A one-page summary of a scientific paper presented in the class (10-15 min presentation). This can be done in groups of two.

Lecture Attendance: It is important to attend all lectures. Students are responsible for all material covered in lecture. At times, material may appear in class that is not covered in the assigned text. You must be on time for lectures; the announcements made at the beginning of class often are vital.

Grade Scale

A+ (4), A(3.8), A- (3.66), B+ (3.33), B (3.00), B- (2.67), C+ (2.33), C (2.00), D (1.00), F (0.00)

Course Policies:

A. Re-grading Policy

Requests for re-grading must be in writing and handed in no later than one week after graded exams or assignments are returned.

B. Make-up Policy

Make-ups will not be given, unless for exceptional circumstances with a legitimate excuse (e.g., signed doctor's excuse). Make-up exams will be all essay. Otherwise, any missed exams will be scored a zero.

Make-up exams must be taken within one week of the missed exam.

C. Late Policy

Assignments are due on the posted deadline.

DISABILITIES: If you are a student with disability and you need academic accommodations, please see me and contact the office of Disability Support Services at 703/993-2474. All academic accommodations must be arranged through this office.

HONOR CODE: Adherence to the GMU honor code is expected of all students. Teamwork and group discussions are highly encouraged but exams and homework are expected to be your own words and effort.

(<http://www.gmu.edu/catalog/apolicies/index.html#Anchor13>

<http://catalog.gmu.edu/content.php?catoid=15&navoid=1039#Honor>

<http://academicintegrity.gmu.edu/>)

Academic Integrity: The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using the appropriate format for this class. A simple listing of books or articles is not sufficient. Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting. If you have any doubts about what constitutes plagiarism, please see me.

Disability Accommodations: Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with Disability Services at any time during their enrollment at George Mason University. If you are seeking accommodations, please visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu | Phone: (703) 993-2474.

Covid-19 Note: Students who have a Covid-related disability should contact the Disability Services office; DS will contact faculty using standard protocols about any students who require accommodations. Faculty are not expected to create accommodations for students outside of the Disability Services official guidelines.

Diversity and Inclusion

- *[Women and Gender Studies](#) seeks to create a learning environment that fosters respect for people across identities. We welcome and value individuals and their differences, including gender expression and identity, race, economic status, sex, sexuality, ethnicity, national origin, first language, religion, age and ability. We encourage all members of the learning environment to engage with the material personally, but to also be open to exploring and learning from experiences different than their own.*

- The [School of Integrative Studies](#), an intentionally inclusive community, promotes and maintains an equitable and just work and learning environment. We welcome and value individuals and their differences including race, economic status, gender expression and identity, sex, sexual orientation, ethnicity, national origin, first language, religion, age, and disability.

Notice of mandatory reporting of sexual or interpersonal misconduct: As a faculty member, I am designated as a “Non-Confidential Employee,” and must report all disclosures of sexual assault, sexual harassment, interpersonal violence, stalking, sexual exploitation, complicity, and retaliation to Mason’s Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-993-3686 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance or support measures from Mason’s Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

Privacy: Students must use their Mason email account to receive important University information, including communications related to this class. I will not respond to messages sent from or send messages to a non-Mason email address.

Recording and/or sharing class materials: Some kinds of participation in online study sites violate the Mason Honor code: these include accessing exam or quiz questions for this class; accessing exam, quiz, or assignment answers for this class; uploading of any of the instructor’s materials or exams; and uploading any of your own answers or finished work. Always consult your syllabus and your professor before using these sites.

Undergraduate Course Repetition: Beginning fall 2018, there is a limit of three graded attempts for this course. A W does not count as a graded attempt. Please see AP. 1.3.4 in the University Catalog and consult with your academic advisor if you have any questions.