

GEOL 121 SECTION 203: THE CHANGING OCEAN LABORATORY

FALL 2025

Course Information:

Instructor: Paige Klug
Contact Information: pklug@gmu.edu
Class Hours: Wednesdays, 9:00 – 11:45 am
Class Location: Exploratory Hall, Room 1309
Office Hours: Tuesdays 2:00-4:00PM
Office Location: Exploratory Hall, Room 3416



Course Description

Our oceans are rapidly changing in response to human-induced and natural catalysts. Students will work with oceanographic data to build an understanding of the chemical, biological, geological, and physical processes that control ocean responses to such catalysts. This course should be taken in conjunction with GEOL 120: The Changing Ocean.

Learning Management System

George Mason University has switched to Canvas as the primary location for course materials. Note: You are responsible for checking Canvas regularly so can stay up to date on any important announcements. Please confirm first week that you have your notifications on.

Prerequisites

None. Students must be co-enrolled or have previously completed and passed GEOL 120: The Changing Ocean, the intended lecture course for this lab.

Class Text: Laboratory exercises will be provided by the instructor. However, the following text is recommended as an informational reference to support the lab materials:

Essentials of Oceanography, 13th edition, Authors: Alan Trujillo & Harold Thurman, ISBN: 013489152X / 9780134891521

Student Learning Objectives

Upon successful completion of this course, students will be able to:

1. Plot and interpret an array of oceanographic data types to describe relationships between different variables.
2. Explore the change in the interpretation of a theory when given new evidence.
3. Construct a model of Earth's Energy budget and make predictions.
4. Make predictions about ocean-atmospheric and marine ecosystem responses to various perturbations.

5. Identify geologic materials that compose the seafloor and recognize what factors control their distribution.
6. Practice techniques employed by oceanographers to study ocean environments.
7. Compare modern rates of ocean-climate change to ancient periods of climate perturbation.
8. Calculate rates and exercise computational skills to assess changing environmental conditions.

As a Mason Core Natural Science course, successful completion of this course will also require students to:

1. Understand how scientific inquiry is based on investigation of evidence from the natural world, and that scientific knowledge and understanding:
 - evolves based on new evidence
 - differs from personal and cultural beliefs
2. Recognize the scope and limits of science.
3. Recognize and articulate the relationship between the natural sciences and society and the application of science to societal challenges (e.g., health, conservation, sustainability, energy, natural disasters, etc.).
4. Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information).
5. Participate in scientific inquiry and communicate the elements of the process, including:
 - Making careful and systematic observations
 - Developing and testing a hypothesis
 - Analyzing evidence
 - Interpreting results

Course Structure

Course Requirements and Code of Conduct

Grading: Grading is based on the laboratory exercises given by your instructor. There are 13 laboratory exercises that are equally weighted, and account for 70% of your total grade. The remaining 30% of your final grade is determined by two exams, each worth 15%.

Assignment Type	%
Exam 1	15
Exam 2	15
Lab Exercises (13 in total, lowest score dropped)	70

Final Grade Scale

A+ = 97 – 100%	B+ = 87 – 89%	C+ = 77 – 79%	D = 60 – 69%
A = 93 – 96%	B = 83 – 86%	C = 73 – 76%	F = 0 – 59%
A- = 90 – 92%	B- = 80 – 82%	C- = 70 – 72%	

General Information and Laboratory Policies:

- Students are encouraged to work in groups and collaborate in lab, but each **student must submit their own work**. Students may not submit group work unless otherwise stated by the instructor.
- You are expected to arrive to class ON TIME to ensure you can stay caught up with any announcements or important content. There will be a 10-minute grace period at the beginning of class where I will briefly catch you up on the instructions that you have missed. After this, instructions will not be repeated. You are permitted to enter the lab if you arrive after the grace period; however, the later you arrive, the less time you have to complete the exercise.

Attendance: Attendance at all scheduled course meetings is required to achieve the requisite level of knowledge in this course. There are no make up labs unless requested and approved well in advance. In the case of an excused absence (Illness, family emergency, religious holiday, etc.), the student is responsible for informing the TA in advance or as soon as possible.

Use of technology: Access to a working computer with a stable internet connection is required for course work done outside of class. You should also bring your work device to class each day. During class, please be respectful of our time together and do not engage in activities that are unrelated to class. Cell phones may be left on but muted and used for emergencies only. AI may not be used for lab assignments or exams unless otherwise specified.

Names and Pronouns: I will gladly honor your request to address you by your preferred name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes.

Late Policy: Lab exercises are due at the end of each lab otherwise announced. All lab work must be turned in prior to the end of lab unless otherwise noted. No late work will be accepted.

Communication Plan: Course announcements about exams, class or assignments will be made on canvas. Each student is responsible for checking Canvas regularly to stay up to date on any important announcements. Email is the best way to get in touch with me. If you send me an email, I will respond within 2 business days. Please note, I do my best not to read or respond to emails past 6 pm. I am also reachable in-person before/after class and during office hours. If you would like to meet at an alternative time in person or via zoom, feel free to reach out and we can work together to find a different time to meet.

Course Schedule**

****I reserve the right to make changes to this schedule as needed.**

Day	Topic
Aug. 27	Intro to Ocean Data Interpretation: Basic Tools & Building Data Skills
Sept. 3	Intro to Ocean Data Interpretation: Bathymetry, Maps, & Profiles
Sept. 10	Plate Tectonics
Sept. 17	Earth's Energy Budget
Sept. 24	Station Profiles & Surface Currents
Oct. 1	Deep Ocean Circulation
Oct. 8	Exam 1
Oct. 15	Ocean Acidification
Oct. 22	Marine Sediment
Oct. 29	Marine Productivity
Nov. 5	Marine Ecosystem Dynamics
Nov. 12	Choose Your Own Adventure in Community Science (No In-Person Lab Meeting)
Nov. 19	Waves, Tides, & Coastal Environments
Nov. 26	No Lab- Thanksgiving Break
Dec. 3	Past, Present, & Future Oceans
Dec. 15 (7:30 am–10:15am)	Exam 2

Mason Policy Guidelines

These university and class policies are important to understand:

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

Office of Disability Services: <http://ods.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.

If only your name appears on an assignment, your professor has the right to expect that you have done the work yourself, fully and independently. Mason is an Honor Code university; please see the Office for Academic Integrity for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

Diversity and Inclusion

George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth.

An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected.

The reflection of Mason's commitment to diversity and inclusion goes beyond policies and procedures to focus on behavior at the individual, group and organizational level. The implementation of this commitment to diversity and inclusion is found in all settings, including individual work units and groups, student organizations and groups, and classroom settings; it is also found with the delivery of services and activities, including, but not limited to, curriculum, teaching, events, advising, research, service, and community outreach.

Acknowledging that the attainment of diversity and inclusion are dynamic and continuous processes, and that the larger societal setting has an evolving socio-cultural understanding of diversity and inclusion, Mason seeks to continuously improve its environment. To this end, the University promotes continuous monitoring and self-assessment regarding diversity. The aim is to incorporate diversity and inclusion within the philosophies and actions of the individual, group and organization, and to make improvements as needed.

Sexual Harassment, Sexual Misconduct, and Interpersonal Violence

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 703-380-1434 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 MasonLive email account to receive important University information, including messages related to this class. Please see <http://masonlive.gmu.edu> for more information.