

OCEANOGRAPHY
GEOL 309-EVPP 309-BIOL 309
Fall 2023
T & R 3:00 to 4:15 p.m.
David King Jr. Hall 1006

COURSE INFORMATION

Instructors are available to meet typically right after class, during office hours, or by appointment. All official communication with instructors must be via GMU email.

Dr. Randy McBride	3452 Exploratory Hall
Office hours:	Tues & Thurs: 4:30 to 5:30 pm (immediately after class on the days I teach or by appointment)
Email:	rmcbride@gmu.edu
Dr. Diego Valderrama	3033 David King Hall
Office hours:	Fridays, 2 to 4 pm, or by appointment
Email:	dvalder@gmu.edu

Required Text: Trujillo, A.P. and Thurman, H.V., 2020. Essentials of Oceanography. 13th edition, ISBN: 13: 978013489152-1

Prerequisites: Two of the following lab science courses are required for a total of 8 credits (must have at least two of the following courses): [GEOL 101 or 102], [EVPP 110 or 111 or 210], [BIOL 103 or 213], CHEM 211, and/or [PHYS 160 and 161 or 243 and 244]. *This Oceanography course (GEOL 309-EVPP 309-BIOL 309) is for science majors and science minors only.*

Course requirements: Attendance at lectures, reading of textbook chapters, completion of three written examinations, completion of iClicker quizzes, and iClicker class participation. ***Also, each student is required to have an iClicker handheld remote device, NOT the phone app, in order to participate in the iClicker quizzes and class participation.***

COURSE GOAL, LEARNING OUTCOMES, AND COURSE LOGISTICS

Goal: Explores the geological, chemical, physical, and biological aspects of the global oceans.

Learning outcomes for Oceanography:

1. Demonstrate an understanding of geological oceanography by learning about plate tectonics, ocean basin formation, seafloor provinces, and marine sediments.
2. Demonstrate an understanding of chemical oceanography by learning about the chemical and physical properties of seawater.
3. Demonstrate an understanding of physical oceanography by learning about air-sea interactions (e.g., hurricanes), global ocean circulation, wave dynamics, and tides.

4. Demonstrate an understanding of biological oceanography by learning about marine life, marine environments, biological productivity and energy transfer, animals of the pelagic environment, and animals of the benthic environment.
5. Demonstrate an understanding of interdisciplinary oceanography by learning about marine pollution and climate change.

Method of instruction: Lectures presented by course instructors will include textbook material supplemented by information from peer-review and online resources. Students are expected to read textbook chapters and review lecture PowerPoint slides outside of class. Students are encouraged to ask questions about the covered material. Furthermore, classroom participation will be supplemented by iClicker questions (i.e., quizzes and participation).

Methods of evaluation: Three written tests are given. Questions may include multiple choice, matching, fill-in the blanks, definitions, and essay-type questions. Each of the three written tests is worth 25% of your grade. The final exam may include comprehensive questions. Also, eight iClicker quizzes will be given during the course of the semester, as well as various graded iClicker participation questions (*NOTE: see additional details about iClicker quizzes and participation below*).

Lecture exams may include all textbook and lecture material (including text readings, PowerPoint slides, videos, handouts, etc.). All exams must be taken as scheduled. **Make-ups will not be given**, unless for exceptional circumstances and only if scheduled **PRIOR** to the exam date with a legitimate excuse (e.g., signed doctor's excuse). Make-ups exams will be all essay. Otherwise, any missed exams will be scored a **zero**. ***In addition, all electronic devices must be turned off and put totally away (out of sight) during exams. Once the exam starts, do NOT touch, use, or look at any electronic device until you have completed the exam and are out of the room.*** NOTE: Touching, using or looking at any electronic device during an exam is a breach of the GMU Honor Code. Also, no talking or communication is allowed during exams.

iClicker quizzes: Eight iClicker quizzes will be given throughout the semester. They will cover previously covered information to make sure you are up to date with course materials. The two lowest iClicker quiz grades out of eight iClicker quizzes will be dropped per student; therefore, **no make-up quizzes** will be allowed. Any missed iClicker quiz will be scored a “zero”. The average score of the iClicker quizzes will be worth 15% of your final grade.

iClicker participation questions: These questions will be asked during lectures at random moments, and students will respond by using their iClickers. Grading will be based on participation only, not on the correctness of your answer. ***Thus, the more you attend class, the more you help your grade and vice versa.*** The total participation in these questions will be worth 10% of your final grade.

IMPORTANT: ***All students are required to have an iClicker handheld remote device (not the phone app) to participate in iClicker quizzes and participation questions.*** The phone app is not reliable because it generates recording errors up to 25%, whereas the iClicker remote devices typically show 0% recording errors.

Online resources: A web page is dedicated to this class that can help you learn concepts, study for tests, and further explore the world of oceanography. The web address is **www.masteringoceanography.com**

and for each textbook chapter it includes study-assistance on the following topics: 1) chapter objectives, 2) multiple-choice questions (*Understanding the Concepts*), 3) interactive maps and figures (*Visualizing Oceanography*), 4) fill-in the blank questions, 5) web essays, and 6) hot links to important oceanographic sites (*Destinations [research sites] vs. General Links*). **Note: If you have access to this website through the purchase of your textbook, we strongly recommend using this resource on a weekly basis and as an additional aid for preparing for tests. But, use of this resource is not mandatory.**

GRADING POLICY

<u>GRADED MATERIAL</u>	<u>% of FINAL GRADE</u>
Three Lecture Exams (25% each)	75%
Average score of iClicker Quizzes (highest 6 out of 8; 2 lowest scores dropped)	15%
Total score of iClicker Question Participation (random questions asked during lectures)	10%

Final grade will be assigned based on the following scale, with no exceptions:

FINAL GRADE SCALE:

A+ = 97-100%

A = 93 - 96%

A- = 90 - 92%

B+ = 87 - 89%

B = 83 - 86%

B- = 80 - 82%

C+ = 77 - 79%

C = 73 - 76%

C- = 70 - 72%

D = 60 - 69%

F = 0 - 59%

GENERAL COURSE POLICIES

Attendance in class: mandatory. Attending class is the best strategy for success.

Be considerate: please turn off or mute your cell phone during lecture time. Please do not surf the web while in class unless it involves performing a specific search related to an oceanographic topic being covered in class at that time. Do not disturb your colleagues, come to class on time, but if you are late or need to leave early, be noiseless and invisible.

Email: GMU email is the official way of communicating with students. Make sure that your **GMU email** is set up properly and working. Also, please make sure to include a “subject line” in any sent emails (e.g., GEOL 309 or EVPP 309 or BIOL 309).

CANCELED CLASSES: If an examination is scheduled for a day on which classes are canceled because of inclement weather or any other reason, the examination will be given during the next scheduled class. Call (703) 993-1000 or GMU website for official notification of canceled classes.

Disability Statement: If you have a documented learning disability or other condition that may affect academic performance you should: 1) make sure this documentation is on file with the Office of Disability Services (SUB I, Rm. 2500; 3-4306) to determine the accommodations you need; and 2) give copies of your disability documentation to your instructors so we may discuss your accommodation needs.

Honor Code: GMU students, faculty and staff are bound by the GMU honor code. Adherence to the *GMU Honor Code* is expected of all students, specifically:

Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.

In all assignments and communications, plagiarism will not be tolerated. This applies equally to oral and written communications in the context of any evaluated (graded) course assignments. As stated in the Honor Code, infractions may result in invalidated credit for dishonorable work and lowered grade, including failure from the class, suspension or dismissal. Inquiries for clarification from the professor are welcome. For more information see the complete honor code in the university catalog.

Studying for Success: To achieve best results, for each hour of lecture, expect to spend a minimum of two hours of studying on your own. Spread that time throughout the week. Do not get behind with the readings; *trying to catch up with mega-study session is not a very effective strategy, it results in memory black outs at exam time.* If you have questions, please do not hesitate to ask. There are no dumb questions, only ignorance as a result of failure to seek an answer.

Oceanography – Tentative Lecture Schedule

<u>Date</u>	<u>Lecture Topic</u>	<u>Text Chapter</u>
Aug 22 (D)	Introduction to Planet “Earth”	1
Aug 24 (R)	Plate Tectonics & the Ocean Floor	2
Aug 29 (R)	Plate Tectonics & the Ocean Floor (continued)	2
Aug 31 (R)	Marine Provinces	3
Sep 5 (R)	Marine Sediments	4
Sep 7 (R)	Marine Sediments (continued)	4
Sep 12 (D)	Properties of Water	5
Sep 14 (D)	Chemistry of Seawater	5
Sep 19	Exam I	
Sep 21 (R)	Air-sea Interaction	6
Sep 26 (R)	Ocean Circulation, Horizontal & Vertical	7
Sep 28 (R)	Global Ocean Circulation	7
Oct 3 (R)	Global Ocean Circulation	7
Oct 5 (R)	Waves and Water Dynamics	8
Oct 10	NO CLASS, MONDAY CLASSES MEET TUESDAY	
Oct 12 (R)	Waves and Water Dynamics	8
Oct 17 (R)	Tides	9

Oct 19 (R)	Tides	9
Oct 24	Exam II	
Oct 26 (D)	Beaches & the Coastal Ocean	10
Oct 31 (D)	Marine Pollution	11
Nov 2 (D)	Marine Life and the Marine Environment	12
Nov 7 (D)	Biological Productivity and Energy Transfer	13
Nov 9 (D)	The Plankton: Drifters of the Sea	13
Nov 14 (D)	Animals of the Pelagic Environment	14
Nov 16 (D)	Marine Mammals	14
Nov 21 (D)	Animals of the Benthic Environment (Intertidal & Coral Reefs)	15
Nov 23	NO CLASS, HAPPY THANKSGIVING	
Nov 28 (D)	Animals of the Benthic Environments (e.g., Hydrothermal vents)	15
Nov 30 (D)	Oceans & Climate Change	16
Dec 5	NO CLASS, READING DAY	
Dec 7	FINAL EXAM <u>1:30 – 4:15 p.m.!! (No exceptions)</u>	