

INSTRUCTOR: GREG MOORE and KATHLEEN RUTTENBERG
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Office Hours: T-Th 3:00 – 4:00 and by appointment
(send us an email or talk to us to schedule a convenient time)
Class Times: Tuesday-Thursday 1:30 – 2:45 pm (MSB 305)
REQUIRED TEXTS: *The Ocean Basins: Their Structure and Evolution (OB)*
Marine Biogeochemical Cycles (MBC)
Web Address: <http://www.soest.hawaii.edu/GG/GG423>

The primary objective of this course is to learn about the origin, structure and evolution of the ocean basins and their margins. Our approach will be interdisciplinary, requiring integration of chemical, physical and biological processes, as well as geologic processes.

The class times will be mostly devoted to lectures and discussion. Please be sure to read the appropriate section in the text *before* class. Time will be set aside at the beginning of each class to answer questions from previous lectures or readings, and to present any current geologic events.

Grades will be based on class participation (5%), homework and quizzes (15%), two mid-term exams (25% each) and a class project (30%). There will be NO final exam. There will be a separate grading system for Graduate students and Undergraduates.

The exams will be approximately one hour long. Please note that the homework exercises will be due at the BEGINNING OF CLASS on the due date -- LATE HOMEWORK WILL NOT BE ACCEPTED because I will go over the assignments in class. Make-up exams and incomplete grades will be given only with a written excuse. Full credit for class participation means attending all classes, staying current on the readings, asking good questions, answering questions and participating in class discussions.

The class project will include researching a topic in Marine Geology that is of interest to you (must be approved by the instructor), preparing a one-page abstract, and giving a 15-minute presentation to the class. Additional details will be provided at a later date.

We will make use of the World Wide Web for various homework exercises. We will also post our lecture notes and other class information there. Please visit the URL listed above to make sure that you can access it.

This is an Upper Division course with a prerequisite of GG 302 (Igneous and Metamorphic Petrology), or consent of the instructor.

The Department of Geology and Geophysics has established the following undergraduate student learning objectives. Keep especially objectives 1, 4 and 5 in mind as overarching targets of our curriculum in GG/OCN 423.

1. Students can explain the relevance of geology and geophysics to human needs, including those appropriate to Hawaii, and be able to discuss issues related to geology and its impact on society and planet Earth.
2. Students can apply technical knowledge of relevant computer applications, laboratory methods, and field methods to solve real-world problems in geology and geophysics.
3. Students use the scientific method to define, critically analyze, and solve a problem in earth science.
4. Students can reconstruct, clearly and ethically, geological knowledge in both oral presentations and written reports.
5. Students can evaluate, interpret, and summarize the basic principles of geology and geophysics, including the fundamental tenets of the sub-disciplines, and their context in relationship to other core sciences, to explain complex phenomena in geology and geophysics.

GG/OCN 423 *TENTATIVE* LECTURE OUTLINE

WEEK #	DATE	TOPIC	READING	INSTRUCTOR
1	8/24	Introduction	OB Ch. 1	GM, KR
	8/26	Geological/Geophysical Exploration Techniques	OB Ch. 1	GM
2	8/31	Ocean Basin Morphology	OB Ch. 2	GM
	9/2	Continental Drift, Sea Floor Spreading	suppl	GM
3	9/7	Plate Tectonics	suppl	GM
	9/9	Tectonic History of the Oceans	OB Ch. 3	GM
4	9/14	Oceanic Lithosphere	OB Ch. 4	GM
	9/16	Mid-Ocean Ridges	OB Ch 5	GM
5	9/21	Passive Continental Margins	suppl	GM
	9/23	Active Continental Margins	suppl	GM
6	9/28	Continental Shelves	OB Ch 6	KR
	9/30	Sea Level, Near-shore Processes	OB Ch 6	KR
7	10/5	Exam review		GM
	10/7	<i>Class Project Topic Approved</i> 1st Exam		
8	10/12	Global Cycle of Elements	OB Ch 7	KR
	10/14	Sediment Classification, Oceanic Circulation	MBC Ch 1	KR
9	10/19	Seawater Chemistry	MBC Ch 2	KR
	10/21	Biochemical Processes in Seawater	MBC Ch 2	KR
10	10/26	Biogenic Oceanic Sediments	MBC Ch 3	KR
	10/28	Biogenic Sediments, CCD	MBC Ch 3	KR
11	11/2	Election Day		
	11/4	Terrigenous Sediments	MBC Ch 3	KR
12	11/9	Turbidites, Submarine Fans	MBC Ch 3	KR
	11/11	<i>Class Project Outline Due</i> Veteran's Day Holiday		
13	11/16	Paleoceanography, Climate Change	MBC Ch 4	KR
	11/18	Cenozoic Paleoceanography/Orbital Forcing	MBC Ch 4, suppl	KR
14	11/23	Deep Sea Clays, Authigenic Sediments	MBC Ch 5	KR
	11/25	Thanksgiving Holiday		
15	11/30	Deep Biosphere, Methane Hydrates	MBC Ch 5, suppl	KR
	12/2	2nd Exam		
16	12/7	Student Presentations		GM, KR
	12/9	Student Presentations		GM, KR

For Readings, **OB** = Ocean Basins; **MBC** = Marine Biogeochemical Cycles; **suppl** = supplementary readings provided on web site