

MAS 603: Geological Oceanography
Spring 2008
Your Host: Doug Haywick

Course Description: Geological oceanography or "marine geology" is a broad subject dealing with components of mineralogy, sedimentology, geophysics, and plate tectonics. Topics covered are itemized below. Please note that this is a tentative schedule and the management reserves the right to change some of the subject matter in the event of unforeseen circumstances. The first part of the course is a general introduction to geology and in particular, plate tectonic theory.

Objectives: This course has several objectives, but three of the most important are: (1) to introduce students to geological concepts pertaining to plate tectonic theory and ocean development, (2) to provide students with an understanding of sedimentation in oceans, and (3) to introduce students to some of the practical skills needed to conduct geological research in the marine environment.

The Game Plan: This course will usually consist of 3 hours of lectures a week.. Wherever possible, I have included open discussion sessions where we can ALL discuss a topic (believe it or not, I'd rather not do all of the talking). The discussion sessions usually follow reading assignments. We have a great amount of flexibility in MAS 603 and I am open to suggestions for different things to do

LECTURE/DISCUSSION GAME PLAN (subject to frequent revision)

WEEK ONE: INTRODUCTIONS & PLATE TECTONICS

- a: course outline, evolution of geology as a science
 - b: Basic Plate tectonic theory; evolution of a unification theory
- No reading this week

WEEK TWO: MORE PLATE TECTONICS

- a: New developments in plate tectonic thinking
 - b: Evolution of the ocean basins and the Wilson Cycle
- Reading 1: Evolution of the Gulf of Mexico (Readings assigned by Zeb)

WEEK THREE: STILL MORE MORE PLATE TECTONICS

- a: Martin Luther King Jr. Holiday
 - b: Origin of the Gulf of Mexico (Open discussion led by Zeb)
- Reading 2: Hydrothermal vents (Readings assigned by Jaime)

WEEK FOUR: SEXY GEOLOGY

- a: Hydrothermal vents (Open discussion led by Jaime)
 - b: Proterozoic geology
- Reading 3: Snowball Earth Hypothesis (Readings assigned by Lucie)

WEEK FIVE: MORE SEXY GEOLOGY

- a: Snowball Earth Hypothesis (Open discussion led by Lucie)
 - b: Subject Banded Iron Formations
- Reading 4: Archean oceans (Readings assigned by Robbie)

WEEK SIX: STILL MORE SEXY GEOLOGY

- a: Archean oceans (Open discussion led by Robbie)
 - b: Ediacarin beasts
- Reading 5: Proterozoic organic evolution (Readings assigned by Isabella)

WEEK SEVEN: MARINE SEDIMENTATION

- a: Proterozoic evolution (Discussion led by Isabella) **[Take home question issued]**
 - b: Sedimentary Facies
- No reading this week

WEEK EIGHT: MARINE SEDIMENTATION

- a: Shelf sedimentation [**Take home question due**]
- b: Submarine fan sedimentation
- Reading 6: seawater evolution and plate tectonics (Readings assigned by Lauren)

WEEK NINE: PALEOCEANOGRAPHY AND PALEOCLIMATE

- a: seawater evolution (Open discussion led by Lauren)
- b: greenhouse vs icehouse conditions
- Reading 7: Paleoclimatology (Readings assigned by Kelly)
- Reading 8: Plio-Pleistocene sea level changes (Readings assigned by Steven)

WEEK TEN: SPRING BREAK

WEEK ELEVEN: PALEOCEANOGRAPHY AND PALEOCLIMATE

- a: Paleoclimatology (Open discussion led by Kelly)
- b: Sea level changes 2 (Open discussion led by Steven)
- Reading 9: Coral reef paleobiology (Readings assigned by Nate)
- Reading 10: The Permian/Triassic mass extinction (Readings assigned by Matt)

WEEK TWELVE: MASS EXTINCTIONS

- a: Coral reef paleobiology (Open discussion led by Nate)
- b: The Permian/Triassic extinction (Open discussion led by Matt)
- Reading 11: Applied marine seismology 1 (Readings assigned by _____)

WEEK THIRTEEN: GEOPHYSICS

- a: Geophysical techniques: gravity and salt diapers
- b: Applied marine seismology 1 (Open discussion led by _____)
- Reading 12: Applied marine seismology 2 (Readings assigned by _____)
- Reading 13: Applied marine seismology 3 (Readings assigned by _____)

WEEK FOURTEEN : GEOPHYSICS

- a: Applied marine seismology 2 (Open discussion led by _____)
- b: Applied marine seismology 3 (Open discussion led by _____)
- Reading 14: Stable isotope stratigraphy (Readings assigned by Heather)

WEEK FIFTEEN: GEOPHYSICS AND ISOTOPE GEOCHEMISTRY

- a: Sequence stratigraphy and the hunt for eustasy [**Earth History Papers Due**]
- b: Stable isotope stratigraphy (Open discussion led by Heather)

WEEK SIXTEEN: FINAL WORDS

- a: Recent climate change (Open discussion led by no one)

Reasonably useful information:

You will be provided with background reading to augment many of the lectures. If you want additional reading material, I suggest the following general textbooks:

Kennett, 1982: Marine Geology, Prentice-Hall Inc., Englewood Cliffs, NJ 813p. (*Despite its age, this is still the best marine geology text out there*)

Tarbuck, E.J. and Lutgens, F.K., 1990: The Earth: An Introduction to Physical Geology. Merrill Publishing, Columbus, 651p. (*An okay general geology textbook if you have no previous geology training*).

<i>Assessment:</i>	Class presentations	30%
	Discussion participation	20%
	Earth History Paper	30%
	Take home question	<u>20%</u>
		100%

Grading: A - 90+
 B - 75 to 89
 C - < 74
 F - virtually impossible unless you really screw up (i.e. murdered the instructor).

Missed lectures: This is a graduate course and I expect that all of you are responsible individuals who would NEVER miss a class. But every once in a while, say, due to the outbreak of thermonuclear war, you might be forced to miss one of them. I will endeavor to provide you with the means to make up the lost material (wherever possible). Much of your grade will be determined on the basis of participation during open discussion sessions. These sessions will usually follow a general lecture on the topic by Doug and will require you to read 1 or 2 additional papers on the subject. Most of these reading assignments will be student selected. The first part of each discussion session will involve a 15 to 30 minute presentation by the person who assigned the papers the previous lecture day. The rest of the lecture slot will be spent discussing the major ideas of the papers that we read, so make sure that you actually read them. I welcome your opinion as to whether the paper was a good read (well written, well argued etc.), or if it sucked. I reiterate: **you will be graded on your participation in the discussion questions.** If you are quiet (i.e., you don't ask questions or fail to provide an occasional opinion or comment), you will receive a weak grade for this part of the course.

Earth History Paper: There have been a lot of wild marine-geology events in Earth History, but, unfortunately, we will only be able to touch on a few of them. We will have to omit topics like asteroid-related mass extinctions, anoxic oceans, evaporated oceans, water from space, even natural nuclear reactors. I'd like you to choose any one event in Earth history (preferably one that you find incredibly interesting) and write a short report about it. The minimum requirements are: 1) it's geological in nature and marine at heart, 2) it's length does not exceed 20 pages and 3) you examined 10 or more peer reviewed references. It will be due the week prior to the end of classes. I will provided you with some possible subjects, but I am very open to anything that you can suggest. Can't think of something? Just ask me.

The fine print: This course will require you to do significant amounts of reading, library research and writing. You are graduate students and I assume that you are familiar with what constitutes plagiarism when using previously published material. Plagiarism is stealing, especially at the graduate level, so avoid it at all costs. Incidentally, if you are unsure of what constitutes plagiarism, talk to me.

Disability disclaimer: In accordance with the Americans with Disabilities Act, students with bona fide disabilities will be afforded reasonable accommodation. The Office of Special Student Services will certify a disability and advise faculty members of reasonable accommodations. If you have a specific disability that qualifies you for academic accommodations, please notify me, the instructor/professor, and provide certification from Disability Services (Office of Special Student Services). The Office of Special Student Services is directed by Ms. Bernita Pulmas and is located in the Student Center, room 270. The phone number is (251) 460-7212.

Changes in Course Requirements: Since all classes do not progress at the same rate, instructors may wish to change the number and frequency of exams, or the number and sequence of assignments. Inclement weather (e.g., hurricanes) may also force rescheduling of lectures, assignments or exams. When ever possible, this material will be made up. Students will be given adequate written notice of any changes in lecture sequence, assignment due dates and/or exam date changes.

D. Haywick Contact Information and Schedule Spring 2008 Semester

How & where to find Doug: I reside in LSCB room 121. I believe in open office hours, so feel free to pay me a visit anytime between 9:00 am & 5:00 pm (except on my research days!). However, I will generally be in my office during the times posted on my schedule. Should you be unsuccessful in your attempts to find me, fear not! You have two options: 1) check the Where's Doug note on my door for my location during normal office hours, or 2) leave a message for me:

Telephone: 460-7569 (Haywick's office – you can leave a message).

e-mail: dhaywick@jaguar1.usouthal.edu

internet: <http://www.usouthal.edu/geology/haywick>

D. Haywick Hours

Time	Monday	Wednesday	Friday
7:00-7:50	Asleep	Asleep	Asleep
8:00-9:15	MAS 603 (LSCB 045)	MAS 603 (LSCB 045)	Office
9:30-9:55			Office
10:10-11:00	GY 112-101 (LSCB 119)	GY 112-101 (LSCB 119)	GY 112-101 (LSCB 119)
11:15-12:05	Office	Office	
12:20-1:10	Lunch	Lunch	
1:25-2:15		Office	
2:30-3:20		GY112 lab 103 (LSCB 335)	
3:35-4:25		GY112 lab 103 (LSCB 335)	
Evening			

Time	Tuesday	Thursday
8:00-9:15	ES 492-101 (LSCB 337)	ES 492-101 (LSCB 337)
9:30-10:45	Office	Office
11:00-12:15	GY 344 (LSCB 337)	GY 344 (LSCB 337)
12:30-1:45	GY 344 lab 1 (LSCB 337)	GY 344 lab 2 (LSCB 337)
2:00-3:15	Office	
3:30-5:20	GY 111L-104 (LSCB 335)	

Note: shaded areas are research\committee\personal times: STAY AWAY!



Please turn off all beepers and cellular phones before you enter the classroom. I hate those noisy things and they can really be an embarrassment to you when they go off. (The embarrassment comes primarily from the tennis balls I throw in your direction)