GEO 401 – Physical Geology (Fall 2010)

Unique Numbers 26350-26390
Class: JGB 2.324; MWF 9:00-10:00
Labs: JGB 2.310; time according to your unique number

Professors:
Jaime Barnes, JGB 3.320A, 471-5379, jdbarnes@jsg.utexas.edu
Office hours: MF 11-12; or by appointment

Dan Breecker, JGB 4.124, 471-6166, breecker@jsg.utexas.edu
Office hours: MF 11-12; or by appointment

Online course information: https://courses.utexas.edu/webapps/login/ plus your EID

Textbooks (both mandatory):
Lecture: Understanding Earth, by Grotzinger and Jordan, 6th edition
Laboratory: Laboratory Manual in Physical Geology, by Busch, R. M., ed. 8th edition

General:

This course is an introduction to the basic concepts of physical geology. There are no prerequisites for this course. There are 3 hours of lecture each week (MWF 9-10), and one 2-hour laboratory session (specific to your unique #).

Goals of the Course:

Most of you will not grow up to be geologists, so why should you take this course? Geology is an interdisciplinary science, incorporating aspects of mathematics, chemistry, biology, and physics. We hope to help you to become more critical thinkers by learning to apply the scientific method to your daily life and assess and filter complex material for yourself. You will gain an increased awareness of geological hazards and the tectonic processes responsible for volcanism and earthquakes. We will continually thread the concepts of "Earth as a system" and plate tectonics to new topics throughout the class. We also hope you will gain an understanding and appreciation of deep time, the processes that formed the soil beneath your feet and the landscapes around you, and your physical impact upon the Earth. Knowledge of geology is useful for careers in education, law, journalism, forensics, public health and many other fields besides the geosciences.

Week	Date	Topic	Reading	Lab
1	25-Aug	Introduction-Why should we care about geology?; Scientific method		No lab this week
	27-Aug	Origin of Earth; Earth's structure (overview)	Ch.1; p.216-222	
2	30-Aug	Plate tectonics	Ch.1 con't; Ch.2	1: Plate tectonics
	1-Sep	Plate tectonics	Ch.2 con't	
	3-Sep	Earth materials- minerals and rocks	p.55-79	
3	6-Sep	*No class- Labor Day*		2: Minerals

	8-Sep	Earth materials- minerals and rocks, con't	p.55-79 con't	***Monday labs- attend***
	10-Sep	Igneous rocks and processes	Ch.4	***any other session***
4	13-Sep	Igneous rocks and processes, con't	Ch.4 con't	3: Igneous Rocks
	15-Sep	Sedimentation	Ch.5	
	17-Sep	Sedimentary rocks	Ch.5 con't	
5	20-Sep	Metamorphic rocks	Ch.6	4: Sedimentary Rocks
	22-Sep	Metamorphic processes	Ch.6 con't	
	24-Sep	*****FIRST EXAM*****		
6	27-Sep	Deformation	Ch.7	5: Metamorphic Rocks
	29-Sep	Geologic Time: relative dating	p. 191-202	
	1-Oct	Geologic Time: absolute dating	p. 202-208	
7	4-Oct	Isostasy; Origin & evolution of the continents	p. 375-376, Ch.10	6: Geologic Time
	6-Oct	Orogenesis	Ch.10, con't	
	8-Oct	Volcanoes	Ch.12	
8	11-Oct	Volcanoes, con't	Ch.12, con't	**Lab Midterm Exam**
	13-Oct	Earthquakes- mechanics	Ch.13	
	15-Oct	Earthquakes- hazards	Ch.13, con't	
9	18-Oct	Interior of the Earth- how do we know what's in there?	Ch.14	7: Earthquakes
	20-Oct	Earth's internal structure; convection; magnetic field	Ch.14, con't	
	22-Oct	*****SECOND EXAM*****		
10	25-Oct	The climate system	Ch.15	8: Topographic Maps
	27-Oct	Weathering and soil formation	Ch.16	
	29-Oct	Erosion and mass wasting	Ch.16, con't	
11	1-Nov	The hydrologic cycle	Ch.17	9: Geologic Structure
	3-Nov	Groundwater and aquifers	Ch.17, con't	
	5-Nov	Rivers and streams: Austin's water supply	Ch.18	
12	8-Nov	Winds, deserts, and desertification	Ch.19	10: Streams
	10-Nov	Coastal processes	Ch.20	
	12-Nov	Glaciers	Ch.21	
13	15-Nov	Past glaciations; Sea level change	Ch.21, con't	11: Groundwater
	17-Nov	Mineral resources	p.79-85	
	19-Nov	Energy-related resources: fossil fuels	Ch.23	
14	22-Nov	Energy-related resources: alternative energy	Ch.23, con't	**Thanksgiving**
	24-Nov	Forensic Geology- just for fun!		***No labs this week***
	26-Nov	*No class- Thanksgiving*		
15	29-Nov	Human impact on Earth	Ch.23, con't	**Lab Final**
	1-Dec	*****THIRD EXAM*****		

	3-Dec	Overview and Synthesis		

FINAL EXAM: Thursday, December 9, 9 am - noon

(August 30th: Last day of the official add/drop period)

Lecture:

The lecture schedule gives the order of lectures and indicates associated reading assignments (note, the lecture schedule is subject to change as needed throughout the semester). The lectures and reading assignments are designed to complement and reinforce each other, so please take advantage of your textbook. Anything presented in either the lectures or reading assignments is "fair game" on examinations. We do not take attendance, but good attendance is *critical* for your success in this class. Please be considerate of myself and your classmates. We will respect you, so please respect us. Disruptions during lecture will not be tolerated. Please turn off cell phones and pagers! If you bring a laptop to class, please sit where you will not disturb your neighbors.

Exams:

During the semester there will be three lecture exams, given during the regular lecture period. Each exam will cover material from the date of the previous exam up through the class before the exam. However, this course builds upon basic concepts learned early in the course, therefore you will need to retain knowledge of material covered throughout the semester for optimal performance on all exams. The lecture final exam is cumulative and will cover material from the entire course. Note, ***we do NOT give lecture make-up exams.*** You will be allowed to drop your lowest test score from the three lecture exams (see grading below). We do not drop the final exam - everyone must take the final. *You must bring your UT ID cards to all exams. Pencils and erasers will NOT be provided.*

Laboratory:

Laboratory attendance is mandatory. Credit will not be given for work turned in without attending a lab session. You must attend the lab for which you enrolled (unless prior arrangements have been made with the TA or instructor). Working diligently for the full lab period will ensure *minimizing* the time required to complete labs outside of lab time and *maximizing* your grade. Lab exercises are due at the *beginning* of the next session for that specific lab section (e.g., for a lab session meeting Wednesday from 2-4, the lab assignment is due the following Wednesday at 2 pm). Late assignments will not be accepted. You are permitted to drop one lab assignment from your final grade. For all labs, plan on bringing standard supplies: laboratory textbook, mechanical pencil, eraser, pen, ruler, protractor, and calculator. Group discussion about laboratory projects is encouraged, but all work submitted for grading must be an individual's sole effort. *All written work must be in your own words!* Do not let anyone copy your work. Academic honesty is expected, and the usual University rules will be applied to plagiarism or cheating.

Lab exams will be administered during the regular lab times. The laboratory final exam will not be comprehensive, but the final 5 labs build upon the material covered prior to the lab midterm exam and thus you will need to retain knowledge of material from the first 6 labs for optimal performance on the lab final exam. A laboratory make-up exam will be provided ***only*** to those students documenting their absence as legitimate (e.g., medical illness or family emergency). In most cases this will require either prior consent of the instructor or, for medical

reasons, a doctor's statement. Non-approved absences may result in a grade of "0" for the missed exam.

Grading:

Lecture (66%)	*Laboratory (34%)*
3 Lecture Exams (2 highest exams, 20% each)	Laboratory exercises (14%)
Final Exam (26%)	Laboratory midterm exam (10%)
	Laboratory final exam (10%)

There are 3 lectures exams and one final exam. We will drop the lowest lecture exam score. The remaining two are worth 20% each. The final is cumulative and is worth 26% of your grade. There are 11 lab exercises. We will drop the lowest score. The remaining 10 exercises make up 14% of your grade. There is one lab midterm and one lab final, each worth 10% of your grade. *The laboratory component of this class is worth 34% of your total grade.* ***We do not give lecture make-up exams!***

Office Hours:

Our office hours are for your benefit. We do not host exam review sessions. Please come see one of us if you have questions.

Blackboard:

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Special Needs:

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Students are expected to read and to strictly adhere to the University's Honor Code and written policies on academic dishonesty. Cheating or plagiarism will not be tolerated. Any student caught violating University policy will be referred to the Dean of Student Affairs for disciplinary action. *All written work must be in your own words!*

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Week	Date	Topic	Reading	Lab
1	26-Aug	Introduction-Why should we care about geology? Scientific method, Origin of the Earth		No lab this week
2	31-Aug	Earth's structure (overview); Plate tectonics	Ch.1; p.216-222	1: Plate tectonics
	2-Sep	Plate tectonics	Ch.2	
3	7-Sep	Earth materials- minerals and rocks	p.55-79	2: Minerals

	9-Sep	Earth materials- minerals and rocks, con't	p.55-79 con't	***Monday labs- attend any other session***
4	14-Sep	Igneous rocks and processes	Ch.4	3: Igneous Rocks
	16-Sep	Sedimentary rocks and processes	Ch. 5	
5	21-Sep	Metamorphic rocks and processes	Ch. 6	4: Sedimentary Rocks
	23-Sep	*****FIRST EXAM*****		
6	28-Sep	Deformation	Ch. 7	5: Metamorphic Rocks
	30-Sep	Geologic Time: relative dating	p. 191-202	
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8	12-Oct	Volcanoes	Ch.12	**Lab Midterm Exam**
	14-Oct	Earthquakes	Ch.13	
9	19-Oct	Interior of the Earth	Ch.14	7: Earthquakes
	21-Oct	*****SECOND EXAM*****		
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13	16-Nov	Glaciers	Ch.21	11: Groundwater
	18-Nov	Natural resources	p.79-85; Ch.23	
14	23-Nov	Human impact on Earth	Ch.23, con't	**Thanksgiving-** ***No labs this week***
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