

EARTH SCI-1100 “Planet Earth: How it Works” (Spring 2015)

Tuesday and Thursday 11:10pm- 12:30pm, ML 100

Instructor: Professors Andréa G. Grottoli and C.K. Shum

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Office Hours: Tuesday and Thursday 12:30-1:30pm

Required Textbooks (available at <http://ohiostate.bncollege.com>):

Earth: Portrait of a Planet (4th Ed) by Stephen Marshak, Norton & Co, New York (ISBN 9780393935189)

Any edition of the book is fine, but listed chapter readings correspond to the 4th Ed.

Copies of this and other Earth Science textbooks will be on reserve in the Orton library.

Earth Sciences 1100 Lab Manual by Bancroft (ISBN 9780738055893)

GE Category GE natural science: physicals science course.

GE Natural Science Learning Goals and Objectives

Students understand the principles, theories, and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world.

GE Physical Science Expected Learning Outcomes

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students understand key events in the development of science and recognize that science is an evolving body of knowledge.
3. Students describe the inter-dependence of scientific and technological developments.
4. Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

OVERALL COURSE GOAL

This course is designed to provide a general overview of Earth Science. It is constructed such that all students (irrespective of their major area of study) can learn about Earth Sciences. The course will cover brief overviews of the four major systems of Earth Science: lithosphere (earth surface and interior), atmosphere (air, wind, weather), biosphere (living material), hydrosphere (oceans, lakes, rivers, groundwater). Emphasis will be placed on showing how the Earth systems are connected. The goal of the course is to provide students with a basic understanding of Earth Science so that they can understand and evaluate current related topics in the media, have a foundation for future study in Earth science, and gain an appreciation for the complexity and beauty of the Earth. The course will loosely follow concepts presented in the textbook, will be enhanced with additional information, and provide a framework for discussion about the larger implications and applications of those concepts.

This course will have two components: 1- two weekly lectures and 2- a lab once a week. Both the lab and lecture are required. The weekly lectures will be multi-media presentations of the various topics. Video clips and power point slides will be used. The major graphs and figures (as power point files) will be posted for each lecture on Carmen (<https://carmen.osu.edu>) before each lecture. These files are lecture outlines or guides, and not complete notes for the lecture. Students

should take notes directly on their electronic or printed copies of the lecture outline slides. Periodically, additional readings will be uploaded on the Carmen site, as well as messages and reminders. The lab is a weekly session designed to introduce some quantitative techniques and give some hands-on experience in the Earth Sciences. The lab material will not necessarily match up with lecture topics. The lab is a stand-alone learning unit. Details about the lab manual, lab exercises, and grading will be provided by the teaching assistant in your lab section. Weekly homework will be assigned at each lab.

GRADING

Exams	80%
Lab	20%

There will be four exams. The lowest of the four exam grades will be dropped. The remaining 3 exams will each be worth 26.67%. Exams are not graded on a curve. *Typical* letter grade ranges looks like this:

Letter	Grade Range	Letter	Grade Range
A	90-100	C+	65-69.9
A-	85-89.9	C	60-64.9
B+	80-84.9	C-	55-59.9
B	75-79.9	D	50-54.9
B-	70-74.9	F	<50

Exams: There will be three exams during the semester. The fourth exam will be scheduled during final exam week. The exams are not cumulative. Exam questions will only be drawn from materials and discussions presented in class. Exam questions can cover any material covered during lectures including calculations, graphs, tables, maps, definitions, animations, movies, etc. Any of the following type of questions may be given on an exam: multiple choice, fill in the blank, short answer, true or false. Each exam will have two parts: closed book (first 40 minutes) and open book (next 30 minutes). For each exam, the closed-book portion will count for 75% of that exam's grade and the open book portion will count for 25% of that exam's grade. Exam Q&A review sessions will be held online using the Carmen discussion group. Please bring the following items to exams: eraser, pencil and your BuckID. You are responsible for attending the exams on the scheduled dates and time. Make-up exams will be granted only in some cases*. Make-up exams may be given as oral exams. The final exam date and time are set by the university. If you miss the final for any reason, you must petition for a make-up exam through the university. Please see me immediately regarding any extenuating circumstances that pertain to any exams.

TIPS

Participation: Regularly attending classes, asking questions in class, participating in class/lab discussions is critical to your learning. You learn by reading the information, hearing it, writing about it, and talking about it. The more of these components you exercise in this course, the easier it will be for you to understand and retain the information.

Bonus points: Random attendance will be taken during the semester to get an idea of who is regularly attending class. Up to 2 bonus points may be given to those attending lectures (that is a full point added to your final grade). These bonus point days will not be announced in advanced. There is no opportunity to do extra work for extra credit in this class.

Other tips: Be considerate of your classmates by arriving on time, turning off your cell phone, pager, or any other noise-making device before entering the classroom and by refraining from having

discussions with your friends during lectures. Tardiness, whispering, and technological devices can be extremely disruptive.

Labs are taught by graduate student TAs. *Lab attendance* at your assigned lab time is required. *Lab assignments* are to be turned in to your lab section TA. Assignments must be clearly printed. Diagrams can be drawn by hand and must be very clear. TAs will provide additional information during the first lab. Labs start the third full week of classes.

Course pre-requisites and expectations:

This course has no pre-requisites. Not open to students who already hold credit for EarthSci 100 or GeolSci 100. This course is available for EM credit. GE natural science: physicals science course. NS Admis Cond Course.

Academic integrity (Academic Misconduct): The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct* (http://studentaffairs.osu.edu/pdfs/csc_12-31-07.pdf). Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute Academic Misconduct. "It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/pdfs/csc_12-31-07.pdf)."

STUDENTS WITH DISABILITIES

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs.

Office for Disability Services 150 Pomerene Hall, 1760 Neil Avenue
telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>

Policy on Religious Holidays: The University recognizes/observes holidays as listed on <http://controller.osu.edu/pay/pay-holidays.shtm>. If you observe any other religious holidays, please make special arrangements in person with the instructor within the first two weeks of class.

Earth Sciences 1100 – Lecture Topics (subject to change)

Spring 2015

Week	date	Topic	Readings
1	13 Jan	Introduction, Syllabus, What is Earth Science?	Prelude
1	15 Jan	The Earth: Formation from Big Bang to present	Ch 1 & 2
2	20 Jan	Lithosphere : Plate Tectonics	Ch 3 & 4, See for Yourself C
2	22 Jan	Lithosphere: Rocks and Rock Cycle	Ch 5, Interlude A & C
3	27 Jan	Lithosphere : Volcanoes	Ch 6, See for Yourself G
3	29 Jan	Lithosphere : Earthquakes	Ch 10
4	3 Feb	Lithosphere : Sediments, Soils	Interlude B & Ch 7
4	5 Feb	Exam 1	
5	10 Feb	Lithosphere : Sedimentary Rocks	Ch 7
5	12 Feb	Biosphere : Evolution of Life in the Biosphere	Ch 12 & 13
6	17 Feb	Biosphere : Paleontology	Interlude E
6	19 Feb	Biosphere : Coral Reef Ecosystems	No readings
7	24 Feb	Biosphere – Earth system : Human impacts on the Environment	No readings
7	26 Feb	Biosphere - Earth System : Paleoclimatology	p. 795-804
8	3 Mar	Exam 2	
8	5 Mar	Atmosphere : Composition and Circulation	Ch 20
9	10 Mar	Atmosphere - Hydrosphere: Hurricanes and Weather	Ch 20
9	12 Mar	Hydrosphere : Ocean Circulation	Ch 18
		SPRING BREAK	
10	24 Mar	Hydrosphere : Tsunamis	No readings
10	26 Mar	Hydrosphere : Rivers and Lakes	Ch 17, Interlude F
11	31 Mar	Hydrosphere: Groundwater and Water Resources	Ch 19
11	2 Apr	Exam 3	
12	7 Apr	Lithosphere : Earth Magnetism	Interlude D
12	9 Apr	Lithosphere : Imaging the Earth from Space	No readings
13	14 Apr	Earth System: Carbon Cycle and Global Warming	Ch 23 pages 805-819
13	16 Apr	Earth System: Energy	Ch 14 & 15
14	21 Apr	Earth System : Minerals, Oil, Gas, and Alternative Fuels	Ch 14 & 15
14	23 Apr	Energy use at OSU – guest speaker Aparna Dial	
4 May		Exam 4 (during finals)	ML100 from 10-11:45am

LABORATORY SYLLABUS (SUBJECT TO CHANGE)

Lab Objectives

- To become familiar with the scientific process, geologic concepts and terminology, and the tools used by practicing earth scientists
- To become a “trained observer”
- To appreciate the interdisciplinary nature of earth science

Attendance

- You must attend lab every week
- A valid excuse and documentation are required to make-up a lab
- If you know you will be missing a lab, please let me know ASAP so we can arrange for you to attend another lab section (at the discretion of that TA)
- If you miss a lab without a valid excuse, that lab will be your dropped lab grade

Grading

- Lab is worth 20% of your total ES 1100 grade
- Your lowest lab grade will be dropped
- Late assignments will not be accepted – labs must be turned in at the end of each lab period

Details

- You must purchase Exercises for Earth Sciences 1100 Lab Manual [2011-2012] and bring it with you to each lab. You must complete the lab using the sheets provided in the manual, not on a separate sheet of paper. Failure to turn in labs completed from the manual will result in a warning at the first occurrence, and the loss of 15% of your lab grade for that day for each subsequent occurrence.
- Also bring to each lab: a pencil with an eraser, a calculator, and a ruler
- It is highly recommended that you read the introduction to each week’s lab prior to the lab period – this will enable you to complete the lab more quickly
- Come to lab on time – I spend the beginning of each lab discussing what you need to complete the lab effectively
- Work is often done in groups, but each student is responsible for contributing to the group’s completion of the lab, as well as turning in their own assignment
- Silence cell phones during lab
- *If you have any type of disability please come see me and we can discuss accommodations*

Lab Schedule

Week of Semester	Date	Lab Manual #	Topic
1	Jan. 12	First week - No Lab	
2	Jan. 19	MLK Jr. Holiday - No Lab	
3	Jan. 26	Lab 1	Scientific Method Museum Field Trip #1
4	Feb. 2	Lab 3	Prospecting for Diamonds I: Indicator Minerals
5	Feb. 9	Handout	Rock Identification
6	Feb. 16	Lab 2	Discovering Plate Tectonics
7	Feb. 23	Handout	Earthquakes and Hot Spots
8	Mar. 2	Handout	Relative and Absolute Dating
9	Mar. 9	Lab 5	Tsunamis I: Simulating Waves in a Wave Tank
10	Mar. 16	Spring Break - No Lab	
11	Mar. 23	Lab 6	Tsunamis II: Hazard Assessment on Kauai
12	Mar. 30	Lab 7	Streams and Flooding: Experimenting with a Stream Table
13	Apr. 6	Lab 8	Water History of the South Oval
14	Apr. 13	<i>Last Lab!</i> Lab 9	Paleoclimate: Ice Cores and Global Climate Change