GEOL SCI-100 "Introduction to Earth System Science"

Instructor: Dr. Andréa G. Grottoli, Assistant Professor
Contact: 329 Mendenhall
Office Hours: Monday and Wednesday 3:30pm -4:30pm

Textbook:
Essentials of Geology (2nd Ed). By S. Marshak. Norton publishing (available at the OSU main Bookstore). The CD that comes with the book is also very interesting.

Lab Manual:
Exercises for Geological Sciences 100. This lab manual is available from UniPrint.

Other suggested textbooks:
The Blue Planet (2nd Ed).
The Earth System (2nd Ed). By Kump, Kasting, & Crane. Pearson Prentice Hall publishing.

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, 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 enhance with additional information and personal experiences, 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, power point slides, and overheads will be used. The major graphs and figures (as power point files or .pdf files) will be posted for each lecture on Carmen (http://telr.osu.edu/carmen/) following each lecture. Additional readings, messages and reminders will be periodically posted on the Carmen site. 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.

GRADING

Best Exam	35%
Middle Exam	25%
Worst Exam	10%
Lab Attendance	5%
Lab Assignments	25%
Bonus points	TBA

Your final grade will automatically be calculated to optimize your grade by giving your best exam the strongest percent weighting and your worst exam the lowest percent weighting.
Course pre-requisites and expectations: This is an undergraduate level course. There are no pre-requisites. This course is designed as a science course for all majors and also fulfills the natural science sequence requirement.

Geological Sciences 100 – Lecture Schedule (subject to change)

Quarter week	Lecture Topic	Suggested Readings
1	Lecture 1, Introduction: Syllabus, What is Earth Science?	Prelude
2	Lecture 2, The Earth: Formation from Big Bang to present	Ch. 1, Interl.D
2	Lecture 3, Lithosphere I: Rocks, Rock Cycle, and Volcanoes (Kiluea Video)	Ch. 7, Interl A&B
3	Lecture 4, Lithosphere II: Plate Tectonics	Ch. 2
3	Lecture 5, Lithosphere III: Earthquakes and Tsunamis	Ch. 8
4	Lecture 6, Lithosphere IV: Sediments, Soils, and Sedimentary Rocks	Ch. 5
4	Lecture 7, Atmosphere I: Composition and Circulation	Supp. readings
5	**Exam 1**	
5	Lecture 8, Atmosphere: Hurricanes and Weather	p. 444-449
6	Lecture 9, Hydrosphere I: Ocean Circulation	Ch. 15
6	Lecture 10, Hydrosphere II: Ocean Basins and Mapping	Ch. 15
7	Lecture 11, Hydrosphere III: Rivers, Lakes, and Groundwater	Ch.14, 16, Interl.E
7	Lecture 12, Global Ocean-Atmosphere Links: ENSO & PDO	Supp. readings
8	Lecture 13, Biosphere I: Life on Earth (a planetary perspective)	Ch 10
8	**Exam 2**	
9	Lecture 14, Biosphere II: Evolution of life in the biosphere	Ch 11, Interlude D
9	Lecture 15, Biosphere III: Forest and Coral Reef Ecosystems	
10	Lecture 16, Earth-Ocean-Atmosphere links: Global Carbon Cycle and Global Change	Ch. 19
10	Lecture 17, Lessons from the Past: What can we learn about past climate from ice, tree, sediment and coral records	Ch. 19
11	Lecture 18, Looking to the Future: Oil, Gas, and Alternative Fuels	Ch 12
11	Lecture 19, Makeup Lecture and Review	
Finals	**Exam 3** 11:30am – 1:18pm in ML100	

Common Laboratory Schedule

(Currently half of the labs are being re-evaluated, removed, or modified to include labs on waves, mineral prospecting, and other new lab activities)

Week	Laboratory Topic
2	Magnetic Storm - View, **take notes** and discuss in lab.
3	Minerals
4	Plate Tectonics and Earthquakes: The Day the Earth Shook - View and discuss in lab.
5	Igneous and Metamorphic Rocks
6	In the Path of a Killer Volcano - View, discuss
7	Sedimentary Rocks and Structures
8	Field Trip: Orton Hall & Geogarden. With TA during your lab.
9	Geologic Time, Dating, & Common Fossils
10	Structural Geology and Geologic Maps