

## Earth and Space Systems

Geol 250, sections 001 and 002, Fall 2013

<b>Professor:</b> Dr. Gwen M. Daley <b>Office:</b> Sims 213F <b>Phone:</b> 323-4973 <b>E-mail:</b> daleyg@winthrop.edu <b>Credit Hours:</b> 3 <b>Meets:</b> MW 9:30-10:45	<b>Room:</b> Sims 201 <b>Office Hours:</b> T 9:30-11:30 and by appointment <b>Text:</b> Lutgens and Tarbuck 2011. Foundations of Earth Science, 6th ed. <b>Co-Requisite:</b> Geol 251 ( <i>Earth and Space Systems Laboratory</i> ) <b>Turnitin Class ID#:</b> 6553771/ <b>Password:</b> rock
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**Course Goals:** To understand the range of processes responsible for the composition and morphology of planet Earth and how the scientific method is used to study the interactions within and between the lithosphere, atmosphere, biosphere, and hydrosphere.

Date	Subject	Reading	Notes
8/21	Introduction		
8/26	Scientific methodologies		
8/28	The Universe		
9/2	Stars build elements		
9/4	Earth's Solar System		
9/9	Seasonality		Solar Observation Window #1 starts
9/11	Exam #1		
9/16	Earth's atmosphere		
9/18	Weather I		
9/23	Weather II		Solar Observation Window #2 starts (Obs. #1 due)
9/25	The hydrologic cycle		
9/30	Groundwater		
10/2	Exam #2		
10/7	Minerals I		Solar Observation Window #3 starts (Obs. #2 due)
10/9	Minerals II		
10/14	Fall Break – No Classes		
10/16	Igneous rocks and processes		
10/21	Weathering and clast production		(Observation #3 due)
10/23	Sedimentary rocks and processes		
10/28	No class meeting - GSA		
10/30	No class meeting - GSA		
11/4	Metamorphic rocks and processes		
11/6	Exam #3		
11/11	Seismology and the Earth's interior		
11/13	Plate Tectonics I		
11/18	Plate Tectonics II		
11/20	Geologic Time I		
11/25	Geologic Time II		
11/27	Thanksgiving – No Classes		
12/2	Open Lecture Topic		Solar Observation Final Report Due (9:30 AM)
12/9	Final Exam	8:00 Monday	

*Subjects and schedule subject to change*

**Attendance:** Class attendance is mandatory and necessary. Please note that if you do not attend the Geol 250 meeting, you may not be allowed to participate in the Geol 251 activity for that same day.

**Student Learning Activities Performance Measures:** Grades in this class will be assigned based on the results of the following:

Exams (3)	15% each	45%
Final Exam		25%
Astronomical Observation Project		10%
In class participation		20%
Total:		100%

Grades will be calculated on a straight scale:

A 90-100	C 70-76.99
B+ 87-89.99	D 60-69
B 80-86.99	F <60
C+ 77-79.99	

This scale may be adjusted downward as determined by the instructor, but the points needed for each grade will never be higher than indicated above (e.g., a student with more than 90 points will always receive a grade of A).

**Exams:** We will be using a pyramid testing technique<sup>1</sup> for all four exams. Each student will answer a set of questions individually, like a standard exam format. After the individual answer sheets are collected, students will be given new question and answer sheets which they will answer in consultation with the other students at their table (up to four other students). The new question sheet will contain a subset of the individual question set (i.e., there will be no new questions). You may choose to opt out of the pyramid testing, and have your grade determined only by your answers on the individual answer sheet, but you must inform me that you are opting out before the exam begins. Missed exams cannot be made up without either written proof of an emergency or prior arrangement.

**Astronomical Observation Project:** We will engage in a semester-long effort to test a hypothesis about the predicted position of the midday Sun in the sky over Rock Hill. It will consist of two parts:

- 1) Data collection (which can be done in groups of up to four students)
- 2) A final report (which must be done individually).

The due dates for both data collection and the final report are absolutely non-negotiable. Plenty of time will be allotted to collect the data and produce the report. It is each student's responsibility to ensure that he or she finishes the work on time. **No credit will be given for late work.** In addition to turning in a hard copy of the final report, an electronic copy must be submitted to Turnitin.

**In class participation:** Your in-class participation grade will be determined based on a combination of attendance, participation in in-class activities and your contribution to class discussion (Do you ask questions? Do you answer questions put to the class? Do you participate in class discussions?).

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<sup>1</sup> For more information about pyramid testing pedagogy, see: Yuretich, R.F., S.A. Khan, R.M. Leckie and J.J. Clement. 2001. Active-learning methods to improve student performance and scientific interest in a large introductory oceanography course. *Journal of Geoscience Education* 49: 111-119.

**General Education Requirements:** Geol 250 and the co-requisite Geol 251 together fulfill four hours of general education requirement for natural sciences. Listed below are the seven fundamental student learning outcomes for natural science courses as well as examples of how they will be fulfilled in Geol 250 and 251.

After completing Geol 250/251 should be:

1. Conversant with a few fundamental concepts from among the three main areas of natural science, including earth, life, and physical sciences (e.g., cosmology, meteorology, hydrology, plate tectonics, physical and historical geology, assessed through exams, homework assignments, the astronomical observation project, Geol 251 laboratory exercises and quizzes)
2. Able to apply the scientific methodologies of inquiry (e.g., the astronomical observation project, Geol 251 laboratory exercises)
3. Able to discuss the strengths and limitations of science (e.g., discussion of scientific methodology, definition of the natural world, some Geol 251 lab exercises, also assessed with exam questions)
4. Able to demonstrate an understanding of the history of scientific discovery (e.g., the development of plate tectonics, discovery of geologic time, assessed through exams and laboratory exercises)
5. Able to discuss the social and ethical contexts within which science operates (e.g., plate tectonics paradigm shift, ethical dilemmas in the international diamond trade, assessed through exam questions).
6. Able to communicate about scientific subjects including (lab courses only) the defense of conclusions based on one's own observations (e.g., the astronomical observation project, Geol 251 laboratory exercises, Geol 251 laboratory write-ups)
7. Able to discuss the application of scientific knowledge to the social sciences and to non-scientific disciplines (e.g., determining how knowledge gained in Geol 251 laboratory exercise can be applied to fulfill South Carolina Department of Education K-8 science standards, assessed through Geol 251 laboratory write-ups)

**University Level Competencies:** Students in Geol 250/251 will fulfill Winthrop ULC #1: Winthrop graduates think critically and solve problems. Geol 250/251 students will have ample opportunities to reason logically, evaluate and use evidence, and solve problems related to the Earth and space sciences. They will be assessed on their ability to reach well-reasoned conclusions based on scientific evidence.

**Classroom Decorum:** As a courtesy to other students, please be aware of how your behavior (e.g., holding conversations during lecture) affects the learning environment. No food of any kind is allowed in Sims 201 at any time. Also, please turn off all cell phones and other electronic devices. If your cell phone goes off during lecture, you will be asked to leave. If it goes off during an exam, your exam will be collected and you will be asked to leave.

**Student Code of Conduct:** Your grade will be based on work you have done. Any attempt to submit anyone else's work as your own is plagiarism, and thus cheating. All substantially identical work submitted by more than one student will be assigned a grade of zero and further action may be taken. Attempting to use any unauthorized material during exams (including calculators or other electronic devices) is strictly forbidden, and is cheating. Falsifying data is a serious ethical violation in science, in addition to being antithetical to the very purpose of science, and it will be treated as such in this course. Unethical behavior such as cheating or falsifying data will result in a grade of "F" for the course and other unpleasant action may also be taken at the discretion of the Winthrop Student Conduct Committee. Please see your student handbook for more details.

**Class E-mail:** I will send out class e-mail messages using Wingspan's "e-mail registered student" function, so potentially important e-mail messages will be sent to whatever e-mail you supplied to the registrar. Please check that account regularly for information about this course.

**Students with Disabilities:** Winthrop University is dedicated to providing access to education. If you have a disability and need classroom accommodations, please contact Gena Smith, Coordinator, Services for Students with Disabilities, at 323-3290, as soon as possible. Once you have your professor notification, please tell me so that I am aware of your accommodations well before the first exam.