

# Earth and Space Systems

*Geology 250 sect. 001 and 002, Fall 2009*

<b>Professor:</b> Dr. Gwen M. Daley	<b>Meets:</b> MW 9:30-10:45 am
<b>Office:</b> 213F	<b>Room:</b> Sims 201
<b>Phone:</b> 323-4973	<b>Office Hours:</b> T 9:30-11:30 and by appointment
<b>E-mail:</b> <i>daleyg@winthrop.edu</i>	<b>Text:</b> Marshak, 2008. Earth: Portrait of a Planet, 3 <sup>rd</sup> Edition.

**Co-Requisite:** Geol 251 (Earth and Space Systems Laboratory).

**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.

**Credit Hours:** 3

Date	Lecture Topic (MW)	Reading
8/26	Introduction	
8/31	Scientific methods	1-13
9/2	History of the Universe	19-23
9/7	Stars and Elemental	23-25
9/9	The Earth's solar system	25-35
<b>9/14</b>	<b>Exam #1</b>	
9/16	Seasonality	700, 703
9/21	The Earth's Atmosphere	693-705
9/23	Weather I	705-711 (HW #1 Due)
9/28	Weather II	711-718
9/30	The Hydrologic Cycle	550-551; 582-602
10/5	Groundwater I	660-675
10/7	Groundwater II	675-681
<b>10/12</b>	<b>Exam #2</b>	
10/14	Minerals I	
<i>10/19-10/21</i>	<i>Fall Break / GSA Meeting - No Classes</i>	<i>120-135</i>
10/26	Minerals II	135-143
10/28	Igneous rocks and processes	144-181
11/2	Weathering	184-198
11/4	Sedimentary Rocks and Processes	198-214
11/9	Metamorphic Rocks and Processes	228-263
<b>11/11</b>	<b>Exam #3</b>	
11/16	Seismology and the Earth's Interior	44-55; 350-361
11/18	Plate Tectonics I	56-84
11/23	Plate Tectonics II	85-117
<i>11/25</i>	<i>Thanksgiving Break - No Classes</i>	
11/30	Geologic Time I	402-429
12/2	Geologic Time II	429-447 (HW #2 Due)
12/7	Biography of the Earth	448-481
<b>12/15</b>	<b>Final Exam (11:30 - Tuesday)</b>	

*Schedule subject to change*

**Attendance:** Class attendance is mandatory and necessary.

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

<b>Exams (4)</b>	20% each	80%
<b>Astronomical Observation Project</b>		10%
<b>Homework Assignments (2)</b>	5% each	10%
<b>Total:</b>		100%

Grades will be calculated on a straight scale:

<b>A</b>	90-100	<b>C</b>	70-76.99
<b>B+</b>	87-89.99	<b>D</b>	60-69
<b>B</b>	80-86.99	<b>F</b>	<60
<b>C+</b>	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). Missed exams can not 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 noon time 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) and 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.

**Homework Assignments:** Each assignment is due on the due date indicated on the assignment, and no late work will be accepted. Extensions can be obtained prior to the due date, but once the due date has passed, the assignment can not be turned in for a grade without written proof of emergency.

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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.

## Geol 250 - Earth and Space Systems - Fall, 2009

**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.

Students 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 the 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*)

**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. Substantially identical work submitted by more than one student will all 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. Unethical behavior such as cheating will result in a grade of "F" for the course and other unpleasant action may also be taken. Please see your student handbook for more details.

**Class Listserv:** We will be using an e-mail listserv this semester. If you registered late for this class, or if there is any other reason that your e-mail address did not make the list, please sign up using these instructions:

<http://www.winthrop.edu/acc/default.asp?Page=pages/classlist.asp> .

**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.