Earth System Science Lab (ES 104 Lab)
POLICIES AND PROCEDURES
Fall Term 2007 - Western Oregon University
Mon. 11 AM-1 PM Wed. 11 AM -1 PM Room 017 Natural Sciences Bldg.

INSTRUCTOR: Dr. S. Taylor **OFFICE:** RM 210 Natural Sciences Bldg

OFFICE HOURS: M 1-3 PM; T 12:30-2:30 W 2-3 PM **PHONE:** (w) 838-8398 (cell) 541-760-9216
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COURSE DESCRIPTION:
This course represents the lab component of ES104 and is designed as a supplement to the lecture portion of the course. The lab is a "hands-on" activity module with topics including basic physical science, astronomy, and physical geology.

REQUIRED TEXTS:
Earth and Physical Science Dept., Western Oregon University, 2007, Lab Manual to Accompany GS104 - Foundations of Physical Science (Photocopied Document)

EVALUATIONS AND EXPECTATIONS:
Student performance will be evaluated on the basis of nine (9) lab exercises and three (3) quizzes. The following is a breakdown of evaluation points:

Lab Exercises (8 x 10 pts)	80 pts	62%
Quizzes (2 x 25 pts)	50 pts	38%
Total	130 pts	100%

*Note: Your final lab grade percentage will represent your final point tally, with 100 pts total possible, this will comprise your lab grade sent to your lecture instructor.

Laboratory Exercises: The labs represent a significant component of the class. All lecture sections of ES104 will be distributed across several lab instructors. Be aware that some of you will have the same lecture and lab instructor, while others will not. The following are the terms and conditions of the Lab-portion of the class:
1) You must pass the lab with an average score > 60% to pass the course! For example, if you have an "A" in lecture, and an "F" in lab, you will receive an "F" for the entire course. Moral of the story, attend and successfully pass the lab.
2) Your lab score will be factored into your final lecture grade as prescribed by the instructor.
3) Lab exercises turned in late will result in automatic point(s) reduction, at the discretion of the lab instructor.
4) The specific lab instructor has the final say in all lab grading. The lecture instructors will abide by the lab instructors grading procedure.

MAKE-UP LABS AND INCOMPLETES
Under NO circumstances will make-up labs be administered without prior arrangement (at least five days) and good reason, with a signed administrative excuse. Please show up on lab day! Many of our labs involve set-ups that will be taken down at the end of the week. Due to room scheduling issues, it is is very difficult to arrange make-up labs. Under NO circumstances will a grade of "incomplete" be issued in the last week of class. If you find yourself in a situation where you can't complete the required course work, please make arrangements with the instructor prior to the last week of class.

LAB NOTES:
A comprehensive set of instructor class notes and lab answer keys are available for download via the internet. The class web site is at URL http://www.wou.edu/taylor ... and follow the links to the "ES104" home page. The class notes are available as Adobe Acrobat Reader files (*.pdf file). Acrobat Reader is free and is installed on many campus PC's. For home installation, Acrobat Reader is also available for download at the class web site, but you will be responsible for properly installing the software (and will do so at your own risk!). Lab answer keys will be posted on the web site as the term progresses. It is strongly suggested that you use the lab answer keys to prepare for the quizzes.

OTHER REQUIRED MATERIALS:
Students will also need access to a scientific CALCULATOR, ruler, and protractor. You will be required to use these materials during lecture, lab, and exams. Please plan accordingly, or you will have trouble successfully completing the class. BRING A CALCULATOR TO EVERY CLASS MEETING.

PRE-LAB READING QUESTIONS AND POST-LAB ASSESSMENT:
A set of pre-lab reading questions will be distributed by your instructor during the first week of class. The pre-lab questions are designed to get you to read through the lab PRIOR to the lab period, so that you are prepared to work on the lab efficiently. Students must complete the pre-lab questions prior to attending lab during a given week. The pre-lab questions will form part of the final lab assignment and will be graded accordingly. The "post-lab" assessment questions for each lab are due at the beginning of the next lab period. The Pre-Lab and Post-Lab questions represent standing homework assignments that will be checked and graded each week.

LAB SCHEDULE:

Week		Lab Topic
1	Week of 9/24/04	No Lab This Week (Lab 1 Homework Take-Home)
2	Week of 10/1/04	Models and Systems
3	Week of 10/8/04	Investigation of the Solar System
4	Week of 10/15/04	Light and Electromagnetic Radiation
5	Week of 10/22/04	LAB QUIZ 1; Introduction to Plate Tectonics
6	Week of 10/29/04	Earthquakes
7	Week of 11/5/04	Mineral Identification
8	Week of 11/12/04	Igneous Rocks
8	Week of 11/19/04	No Lab This Week (Thanksgiving)
10	Week of 11/26/04	Volcanoes; Lab Quiz 2

Pre-Lab Reading Questions for Taylor ES104 Lab Sections

Use your textbooks, internet resources, and lab manual to answer the following questions. The pre-lab questions are due at the beginning of class time for the given Lab Week. **Note: There are duplicate "pre-lab" questions listed in your lab manual, use the sheets attached given here to complete the weekly pre-lab assignments, not those given in the lab manual.**

Lab 1 Models and Systems

1. Define the following terms as related to systems:

A.Open System

B. Closed System

C. Isolated System

2. Is the Earth and open, closed or isolated system, why or why not?

3. What is the distance from the Earth to the moon? How long does it take the moon to revolve around the Earth?

Define the following terms (draw diagrams to illustrate your answers):

A. Waxing moon

B. Waning moon

C. Full Moon

D. New Moon

E. Aphelion

F. Perihelion

Lab 2 Investigating the Solar System

1. Which planet is closest to the sun?

2. list the planets in order of increasing distance from the sun.

3. Which planet is farthest from the sun?

4. Which planet is the largest in the solar system?

5. Which planet is covered in water?

6. Which planet is the hottest planet?

7. What is your favorite planet and why?

Lab 3 Light and Telescopes

Define the following terms and answer the questions:

1. frequency

2. wavelength

3. what is the speed of light in meters per second?

4. list the colors of the visible light spectrum from shortest to longest wavelength.

5. write the equation for velocity as a function of distance and time.

6. How far is the sun from the earth in miles? How about kilometers?

7. If you were traveling at the speed of light, how long would it take you to get from the sun to the earth?

Lab 4 - Introduction to Plate Tectonics

Briefly define the following key words, draw diagrams where necessary.

1. Lithosphere

2. Asthenosphere

3. Divergent Plate Boundary

4. Convergent Plate Boundary

5. Transform Plate Boundary

Questions for Thought

6. What type of plate boundary is Oregon located at?

7. What type of plate boundary is southern California located at?

8. Draw a cross-section of the Earth, showing the internal composition (include inner core, outer core, mantle, asthenosphere, moho, oceanic crust, continental crust).

Lab 5 - Earthquakes

Briefly define the following key words.

1. Earthquake

2. Primary Wave

3. Secondary Wave

4. Epicenter

5. Richter scale

6. Tsunami

Question for Thought

7. How do earthquakes relate to plate tectonics

Lab 6 - Mineral Identification

Briefly define the following key words.

1. Element

2. Mineral

3. Rock

4. Atom

5. Hardness

6. Cleavage

Questions for thought

7. What is the difference between a silicate and non-silicate mineral? Include some answers.

8. What is density and how is it calculated?

Lab 7 – Igneous Rock Identification

1. What are the three main classes of rocks and how do each of them form?

2. Draw and label a diagram of the rock cycle. Be sure to show the three classes of rocks and how the relate with one another.

3. What is the difference between an extrusive and intrusive igneous rock?

4. Define the following terms:

a. phaneritic

b. aphanitic

c. porphyritic

d. felsic

e. mafic

f. magma

g. lava

Lab 8 Volcanism and Volcanic Landforms:

1. What is the difference between cinder cone volcanoes, shield volcanoes, and stratovolcanoes?

2. What type of volcano is Mt. Hood? How do you know? What distinguishes it?

3. What is the difference between a pyroclastic volcanic deposit and a lava flow?

4. What is the difference between volcanic ash and lapilli?

5. Define viscosity and explain how it relates to lava flows?

6. Do all volcanoes erupt in the same way and have the same shape? Why or why not?