

**ES106 – Earth System Science III (Oceans and Atmosphere)  
POLICIES AND PROCEDURES**

Spring Term 2008 - Western Oregon University  
5 CR MW 2:00 – 3:20 PM / 11:00 AM-12:20 PM Room 101 Natural Sciences Bldg.

INSTRUCTOR: Dr. S. Taylor

OFFICE: RM 210 Natural Sciences Bldg

OFFICE HOURS: M and W 3:30-5:30 PM  
T 1-2 PM; By Appt.

PHONE: (w) 838-8398 (cell) 541-760-9216

E-MAIL: [taylor@s.wou.edu](mailto:taylor@s.wou.edu)

WEB SITE: [www.wou.edu/taylor](http://www.wou.edu/taylor)

**COURSE DESCRIPTION:**

This course provides an introduction to Earth System Science, a holistic study of all integrated systems operating on the planet Earth. It is designed as a general science elective, using the Earth as a framework for understanding concepts of physics, chemistry, and geology. Emphasis will be placed on sub-disciplines of hydrology, oceanography, meteorology, and climatology. Major topics will include the chemical and physical aspects of water and water pollution, the oceans and sea floor, attributes of the atmosphere and air pollution, meteorology, and global climate change. Students will learn observational techniques in the spirit of the "scientific method", and generally raising our awareness of the natural environment around us. The "lab" portion of the course will provide the student with an opportunity for "inquiry-based" discovery of concepts developed during the lecture period.

**PRELIMINARY COMMENTS AND COURSE PHILOSOPHY:**

This course will be qualitative (conceptual) and quantitative in nature. Basic mathematical skills will be reviewed and utilized to complete the exercises. Creative instructor-student interaction will be faithfully encouraged to provide a truly relaxed educational atmosphere. A user-friendly approach to science will be emphasized by the instructor.

**REQUIRED TEXTS:**

Tarbuck and Lutgens, 2004, **Earth Science**, 11th ed., Prentice Hall, ISBN 0-13-149751-0

Hewitt, Suchocki, and Hewitt, 2008, **Conceptual Physical Science**, 4<sup>th</sup> ed., Pearson/Addison Wesley, ISBN-13: 978-0-321-51695-4

Lab Manual to Accompany GS106 Foundations of Physical Science, Earth and Physical Sciences Dept., Western Oregon University (photocopied document available at Bookstore)

**\*\*Note about textbook materials:** The Tarbuck - Lutgens and Hewitte Textbook Materials will be used for all sections of ES104, ES105, and ES106. **Please note that this is a considerable cost savings compared to buying three different textbooks for each of the ES 100 courses.**

**CLASS NOTES:**

A comprehensive set of instructor class notes 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 "ES106" 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!).

Based on prior student suggestions, I have assembled my class notes and made them available. These notes may be freely printed at any campus internet station (e.g. ITC Bldg - Student Lab, Library, local department computer labs). The notes are in outline form and are very comprehensive. "Exam Study Guides" will also be posted on the web site as the term progresses.

## **EVALUATIONS AND EXPECTATIONS:**

Student performance will be evaluated on the basis of class assignments, two (2) lecture quizzes, lab score (exercises and quizzes), and two (2) exams. The following is a breakdown of evaluation points and letter grades:

Class Assignments and Quizzes	85 pts	21%
Mid-Term Exam	100 pts	24%
Final Exam	125 pts	31%
Lab Score (Exercises and/or Quizzes)	100 pts	24%
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Total	410 pts	100%

### Final Grading Scale

Percent Range of Total Points	Letter Grade	Percent Range of Total Points	Letter Grade
94-100%	A	77-79%	C+
90-94%	A-	73-76%	C
87-89%	B+	70-72%	C-
83-86%	B	67-69%	D+
80-82%	B-	63-66%	D
		60-62%	D-
		<60%	F

**Homework Assignments:** Class assignments are designed as online (internet-based) "take-home" homework exercises that are submitted electronically at the prescribed due date. Late assignments will not be accepted after the deadline. Special arrangements for turning in late assignments with administrative excuses should be arranged in advance.

**Exams:** Mid-term quizzes and exams will generally cover only the material that was most current prior to that exam. The final exam will be comprehensive with test material drawn from throughout the term. Tests will generally be objective in nature (multiple choice, matching, true/false, completion) with occasional essay questions.

**Exams and Scantron Erasure Mark Policy:** Portions of the class exams may involve use of "scantron" answer sheets. Scantron erasure errors are common in instances where students do not effectively erase all unwanted pencil marks from the answer sheets. Erasure "shadow" marks can result in scantron mistakes with erroneous point subtraction and grade errors. The instructor commonly deals with erasure errors on a case by case basis. One or two erasure errors per exam are no problem and are commonly corrected on the spot. In instances where students claim greater than three scantron erasure errors, the instructor reserves the right to request that the student retake the exam in its entirety.

**Class Assignment Grading:** Due to the large number of students and assignments, the instructor will not grade this work in detail. The homework and assignments will be checked for completeness, with questions randomly chosen for content and accuracy. Grade points will be assigned on the basis of these two criteria. With a modicum of effort, you will do well in this portion of the class.

**Laboratory Exercises:** The labs represent a significant component of the class. All lecture sections of GS106 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 shown above.
- (3) Lab exercises turned in late will result in automatic point(s) reduction, at the discretion of the lab instructor. You must make prior arrangements for make-up labs with lab instructors, as per individual course policy.
- (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 Exams and Incompletes**

Under **NO** circumstances will make-up exams be administered without prior arrangement (at least five days) and good reason, with a signed administrative excuse. Please show up on exam day! 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. Contact the Office of Student Affairs (838-8365) for assistance in arranging incompletes.

### **ATTENDANCE AND ASSIGNMENT POLICY:**

There is a direct correlation between attendance and student performance. Attendance is necessary for students to properly digest intellectual concepts presented in a college classroom format. The class assignments are designed to reward students who attend class on a regular basis. Absences with written excuses for medical reasons or university-related functions may be used to arrange make-up work with the instructor. As with incompletes, contact the Office of Student Affairs to arrange for written excuses (838-8365).

### **STUDENT HONOR POLICY:**

Plagiarism and cheating will not be tolerated. Cheating includes copying others work and using cheat sheets on exams. However, students are encouraged to interact in small groups during class assignments, i.e. you can freely discuss concepts in all portions of the class, except exams.

### **OTHER REQUIRED MATERIALS:**

Students will also need access to a scientific calculator, colored pencils, 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.

### **STUDENTS WITH DISABILITIES**

Any student who has a disability that requires accommodation, please make an appointment to see me.

### **A NOTE ABOUT THE LAST WEEK OF CLASS:**

Given that the Oregon University System employs the "quarter-method" of academic scheduling, upper division courses are by nature "compressed" with much detailed content to cover in a relatively short period of time. As such, the 10th week of class is as critical to content coverage as the 1st week. Students should anticipate a full slate of "normal" activities during the last week of class, including lectures, lab exercises, written reports, etc. The class is not over until after the final exam!

### **A NOTE ABOUT LOST OR MISSING WORK**

The instructor will only grade work that is received and physically visible. Any missing work (lab assignments, homework, quiz/test answer sheets) will receive a "0" on the grade sheet. This policy applies to work lost by the student or instructor. If the student demonstrates that the work was turned in, but is missing due to the instructor's incompetence, then the student will be afforded an opportunity to make up the work and resubmit it for graded credit. Otherwise, the student will not receive credit for lost or missing work.

### **CHANGE OF SYLLABUS - POP QUIZZES - UNANNOUNCED HOMEWORK ASSIGNMENTS**

The instructor reserves the right to modify the syllabus and class schedule at any time during the term. Students will be notified of such changes in a timely manner. The instructor also reserves the right to administer pop-quizzes and assign unscheduled homework / class assignments at any time. All students will be responsible for completing this work and it will comprise part of the final class grade.

**TENTATIVE COURSE OUTLINE:** This outline should be considered tentative at best. The following schedule may be modified as class ideas evolve throughout the semester. Text reading assignments are abbreviated as follows: TL = Tarbuck and Lutgens, "Earth Science" Text, HSH = Hewitt, Suchocki, Hewitt, "Physical Science" Text.

<u>Week</u>	<u>Dates</u>	<u>Class Content</u>	<u>Reading Assignment</u> (author / page)	<u>Lab Exercise</u>
1	Mar31-Apr4	Intro to Earth Systems Earth Overview Hydrosphere and Water Cycle	TL Intro, p. 1-14 TL Appendix A p. 648 TL Ch 5 p. 114-117 HSH: Ch 3, p. 59-86 HSH: Appendix A; Ch. 23 p. 600-601	No Labs This Week
<b>Dr. Taylor at Natn'l Geologist Examiners Meeting, April 2-6. Guest lecturer or other make-up work to be assigned.</b>				
2	Apr 7-11	Heat, Chemical Bonds, Chemistry of Water	HSH: Ch. 6 p. 141-158 HSH: Ch. 12 p. 285-297 HSH: Ch. 15 p. 353-380	Lab 1: Properties of Water
3	Apr 14-18	Heat Transfer, Water Chemistry Intro to Oceanography	HSH: Ch. 7 p. 159-180 TL: Ch. 13-14	Lab 2: Heat and Temp.
4	Apr 21-25	Physical and Chemical Aspects of the Oceans and Sea Floor; Sea Floor Tectonics	TL: Ch 13-14 cont. TL: Ch. 8 p. 215-227	Lab 3: Intro to Oceanography
<b>Quiz 1 – Wed. Apr 16 or Thurs. Apr 17</b>				
5	Apr28-May 2	Oceanography (cont.)	TL: Ch 15	Lab 4: Seafloor Tectonics
<b>Mid-Term Exam – Wed. April 30 or Thurs. May 1</b>				
6	May 5-9	Intro to the atmosphere	TL: Ch 16	Lab 5: Earth-Sun Relations, Solar Heating
7	May 12-16	Atmospheric Moisture	TL: Ch 17	Lab 6: Moisture in Atmosphere, Weather Data
8	May 19-23	Atmospheric Pressure and Wind Weather Patterns and Storms	TL: Ch 18-19 HSH Ch 25	Lab 7: The Climate of Oregon
<b>Quiz 2 – Wed. May 21 or Thurs. May 22</b>				
9	May 26-May30	Weather Patterns and Storms (cont.) Regional Climatology Global Change	TL: Ch 19-20	No Labs This Week
<b>MW Section: NO CLASS Monday May 26 (Memorial Day)</b>			<b>TR Section NO CLASS Thursday May 29</b>	
<b>Thurs. May 29 Academic Excellence Day: MW and TR Taylor ES106 Sections will be attending presentations and compiling written summaries</b>				
10	Jun2-Jun 6	Climate Change, Global Warming, Anthropogenic Impacts on Atmosphere	Readings TBA HSH Ch 24	Lab 8: Climate Change
11	June 9-13	<b>Finals Week (FINAL EXAM - Check Schedule)</b>		

## Homework Assignments

The homework assignments are designed as online exercises using your textbook, the internet, and campus software called "WebCT". I have prepared a set of online, fill-in-the-blank homework exercises that are keyed to chapter readings in your textbook. By using the WebCT software, your homework exercises are administered and graded online. This eliminates much paperwork on my end, and makes your homework seem more like a video game (which makes it slightly more enjoyable for both of us). Individual weekly homeworks will be available for one week at a time throughout the term. **You will only be able to complete and submit the assigned online homework during the availability time. If you miss the deadlines you will receive a "zero" for the homework. Pay attention to the dates listed below!**

**The following are procedures for accessing the online homework assignments:**

- (1) You will have an individual student account set up on WebCT with a username and password.
- (2) The WebCT website may be accessed in the following ways:
  - (a) from the class homepage (www.wou.taylor ... follow the links to ES106 ... then follow the links to "WebCT" in the Homework Assignments section), or
  - (b) by surfing to **http://www.wou.edu/webct**
- (3) Once at the site, choose the "Log On to My WebCT" option. **DO NOT CHOOSE "Create myWebCT", this has already been done for you.**
- (4) Enter your WebCT student username- **This will be the same as your student server username.**
- (5) Enter your password. **Your password will be the last 4 digits of your V#, just like your student server account.**
- (6) Once you are logged in, look for the "Change Password" icon... you can change your password at any time!
- (7) Click on the "Homework Assignment" icon.
- (8) Click on the homework assignment you wish to complete, and begin the online assignment.
- (9) **For each question, type in an answer in the blank box provided and click on the "save answer" radio button. When finished with all questions in the homework, click on "Finish". IF YOU DON'T SEE YOUR "HOMEWORK GRADE" AFTER YOU SUBMIT, THEN YOU DID NOT FOLLOW THE ABOVE INSTRUCTIONS. REMEMBER TO "SAVE ANSWER" FOR EACH QUESTION AND "FINISH" WHEN YOU HAVE COMPLETED THE HOMEWORK.**
- (10) You may stop and begin the assignment as many times as you wish, but only until you click "submit for grading".
- (11) **Make sure you print a hard copy of your homework answers and/or save them as a file on your local drive! The print out will be your hard-copy record that you completed the work. IF YOU DO NOT SAVE A HARD COPY OF YOUR WORK, AND THE COMPUTER RECORDS IT AS "0" THEN YOU WILL RECEIVE A "0"... SAVE A HARD COPY OF ALL YOUR WORK AS A BACK-UP RECORD.**

**Note:** Pay attention to the availability dates, once the deadline has passed you are out of luck! You have unlimited time and an unlimited number of tries to correctly answer and submit the questions. Your highest score will be recorded as the grade.

**Note:** Print your questions and answers from the browser icon... this will be your written record of completing the assignment!! **YOU WILL ALSO NEED THE HARD COPY OF YOUR HOMEWORK TO USE AS A QUIZ AND TEST STUDY GUIDE. ONLINE HOMEWORK QUESTIONS WILL APPEAR ON QUIZZES AND EXAMS.**

### Tips and Tricks for Completing the Online Homework:

- (1) Read the text chapter in question before you start. The text readings are listed on the schedule above.
- (2) Log-on to WebCT and print out a copy of the homework questions.
- (3) Answer the questions on paper with your textbook, prior to working and submitting them online.
- (4) Log-on to WebCT and finish the online assignment.
- (5) Print a copy of your completed online homework, this is your hard-copy record that you completed the assignment (remember - if there is a way for a computer to make a mistake, it will happen to you!).

### Homework Assignment Schedule

No.	Topic	Week	Online Availability Dates
1	Intro	1-2	03/31/08-04/14/08
2	Chemical Bonds/ Heat	2	04/07/08-04/14/08
3	Intro to Oceanography	3	04/14/08-04/21/08
4	Seafloor Tectonics	4	04/21/08-04/28/08
		5	No Online Homework – Midterm Exam
5	Ocean Physics	6	05/05/08-05/12/08
6	Intro to Atmosphere	7	05/12/08-05/19/08
7	Atmospheric Moisture	8	05/19/08-05/26/08
8	Weather Patterns	9	05/26/08-06/02/08
9	Climate Change	10	06/02/08-06/09/08

## STUDY TIPS FOR GENERAL SCIENCE COURSES AT WOU

(modified from Rosalie F. Maddocks, Professor of Geoscience, University of Houston)

### THE IDEAL PLAN OF STUDY FOR HIGHLY SUCCESSFUL COLLEGE STUDENTS

These are things that successful students do. Use what works for you.

1. First, before the lecture on this topic, read the assigned text chapter(s) all the way through, without stopping and without making any marks in the book. The purpose of this first reading is to gain a general familiarity with the topics covered and the organization of the chapter.

2. Then, listen to the accompanying lecture, augment your lecture notes by hand. Try to integrate this information with what you read in the text.

3. Now read the text chapter a second time, more slowly. The purpose of this second reading is to achieve a thorough, complete understanding of the topics covered. This has to be done in chunks, one bite at a time, in sequence.

- Reading out loud, because it uses more parts of the brain (eyes, ears, tongue), can help you to concentrate and to remember better what you read.

- Each time you encounter a word you do not know, look it up in the Index or Glossary of the text or in an English dictionary. If geographic features are mentioned, look them up on maps in the textbook or in an atlas.

- Underlining (highlighting) is a substitute for learning, a promise rather than an accomplishment. It can be a procrastination device. Instead of underlining (promising yourself to study this later), stop right there in your reading and learn now what you have just read, right now. Of course, it is a good idea to mark lightly in pencil in the margin any statements you don't understand, to remind yourself to seek clarification.

- For complex material, it may be a good idea to make your own handwritten notes. Start by outlining the chapter, and then fill in more details. You will find this helps you to see the relationships between topics and the organizational plan of the chapter. Writing is a good way to etch the information into permanent memory. After you have made these notes, throw them away, or at least don't look at them again until you get to the Review phase. The value of the notes is in the doing of them.

- Analyze each illustration, reading the caption and relating it to the text, determining the significance of every line and label in that figure. Illustrations are as important as words in a science text. "Every picture tells a story." Try to explain in words the story that each picture is telling. Then push the book aside and try to sketch the idea yourself, in the same style as the figure. Practice drawing pictures of ideas -- it's called graphical reasoning, and scientists do a lot of it.

4. Now that you understand this material, learn it for permanent recall. Read the chapter for a third time.

- This time, after each paragraph or major section, push the book aside and explain to yourself (aloud or in writing if you wish) the main points of the passage you have just read. Your narrative should be in your own words but should use technical vocabulary and facts.

- The test of whether you understand a topic is whether you can recall and explain it. Teaching is an excellent way to learn -- try explaining these ideas to a friend or family member or study. Talk out loud!

- Study the accompanying lecture notes in a similar manner.

5. Find out whether you are ready for the exam.

-Scan the checklists at the end of the chapter. Can you define, identify, locate, explain, summarize or illustrate every one of the terms and concepts mentioned? If not, look up the ones you missed and study those parts of the text some more.

-Work the Sample Quizzes that may be provided. Check the answers and compute your score. Compare this score with the letter-grade scale for the course. Would you be content with this score?

-If you are not yet satisfied with your score, return to studying the chapter. Then try another quiz.

-Warning: It is a waste of time to attempt the practice quizzes before you have studied the chapter content.

-Warning: Don't try to memorize the answers to quiz questions. A quiz is not something to study. These "short cuts" don't work.

6. A day or two before the exam, review. Skim the chapter, the illustrations, the Lecture Notes and your other notes.

-Review means reminding yourself of what you have already learned, refreshing the memory traces of things you already know so you can find them quickly on the exam.

-Review does not mean learning for the first time. Review is not cramming. No one else can review for you -- only you can review.

## **LEARN TO READ!**

Seriously, it is important to learn how to gather and retain knowledge from reading books and written materials. Reading for a science course is a different kind of reading than, for example, reading for a literature class or reading a novel or newspaper.

You will find that you need to:

Read slowly, for thorough comprehension.

Read completely (no skimming or skipping).

Read sequentially one sentence at a time, evaluating each sentence in its place as a necessary step in the logic of the paragraph.

Read selected passages multiple times, until you understand and can remember (for permanent recall) the information and the steps in the reasoning.

Read the entire chapter two or three or more times.

Have a good general English vocabulary, and use a dictionary as needed.

Integrate the analysis of figures and diagrams into your study of the related text passages.

Some students find that it helps to:

Outline the chapter, writing by hand. The brain learns things that are written more easily than things that are only read. Amplify the outline with each re-reading. But do not treat your outline as something to study. It is only a means to an end. The value of the outline is in the writing of it. Study the chapter,

not your notes.

Read the text out loud, slowly. This involves the parts of the brain that control speech and hearing. The more different parts of the brain you involve in studying, the better the information will be learned.

Break the hard words into syllables and practice pronouncing them correctly. (A dictionary can help with this.) You cannot learn a term (word) you cannot pronounce. Terms (words) are necessary handles (symbols) for concepts. Language (vocabulary) is an integral part of human reasoning. To understand a concept you must learn its "name" (word), and to learn the word you must be able to pronounce it.

Practice writing each new term (10 times on a sheet of scrap paper) until you can spell it correctly. Pronounce the word out loud each time you write it.

Read out loud in a lecturing tone of voice, and expand ad lib on what you are reading.

Read text materials into a tape recorder, and play the tape back and listen to it.

If you have trouble staying awake, stand up and walk around as you read out loud

After organizing the vocabulary and factual material, drill yourself until recall is accurate, consistent and automatic. Some students like to make flash cards.

## **TAKE RESPONSIBILITY FOR YOUR OWN LEARNING**

You should be able to detect for yourself whether you understand a topic, whether you have learned what is necessary, and whether you have completed what needs to be done.

You should be aggressive in using the materials provided. You should be resourceful and timely in seeking assistance when needed.

For example, if there's something you don't understand, ask. Help is as close as an e-mail message to the instructor or to a classmate.

## **MAKE A PERSONAL STUDY SCHEDULE**

It is possible that you will have to study more for this course than for some others you may have taken, especially if this is the first time you have taken a college-level science class.

**The University expects that an average undergraduate student in an average class for an average grade will attend class 3 hours a week and study outside of class for 6 to 7 hours a week, every week.** Everyone is different, so you will need to determine for yourself how much you need to study to achieve your objectives. A student for whom (for whatever reason) the material does not come easily may have to invest more time. **A student who wants a better than average grade may wish to invest more time.**

I find that most students underestimate both their academic potential and the study time they will need to achieve success. Don't settle for second-best. Please budget ample time to do yourself credit.

You should plan a personal study schedule for this class and stick to it. A worksheet is provided here to help you do this. I recommend studying for this course a little every day.

Small doses (an hour or two) repeated frequently are better than total immersion ("all-nighters"). Your brain needs the "down time" between study sessions to process the new information into long-term memory, so you can remember it on the exam. Much of this processing is done during sleep.

Cramming the night before an exam is not an effective way of learning. Stealing study time from one

course because you have an exam in another course works no better in academic life than it would in your financial budget.

Your study program should be part of a sensible personal time schedule for the semester.

That schedule should include realistic time allowances for working, commuting, family responsibilities, recreation, studying, and sleep.

Don't sign up for more classes than you can study for per term. Education is not a race, and there is no prize for speed.

Emergencies happen. Your personal schedule should include some flexibility to accommodate them.

You should be able to keep yourself on task and avoid procrastination. Take charge! Make your own reminders -- whatever works for you -- and stick to your schedule.

### **KNOW YOUR LEARNING STYLE**

You are an adult, and it is expected that you know how to learn by many different methods.

Perhaps some ways are easier for you than others, but it is up to you now to figure this out and to make the appropriate adjustments. For example, if you learn best by listening, you can choose to enroll in a face-to-face section, or you can read the text into a tape recorder and play it back.

### **OTHER RESOURCES**

Check out the tutoring program at the WOU Student Enrichment Program (SEP). If you request a tutor, SEP will find one for you and help you establish positive study habits.

Contact WOU Disabilities Services if you have learning disabilities that need additional maintenance.