ES476/576 HYDROLOGY
POLICIES AND PROCEDURES
Winter 2008 - Western Oregon University
3 CR W 4:00 - 7:00 PM Rm 216-218 NSB

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

OFFICE HOURS: M T 3-5 P.M.; F 2-3 P.M. PHONE: (w) 838-8398 (cell) 541-760-9216
WEB SITE: www.wou.edu/taylor E-MAIL: taylors@wou.edu

COURSE DESCRIPTION:

Water is the most important natural resource on Earth, and its ubiquitous occurrence is what makes our planet unique in the solar system. The science of hydrology is the study of water, its mode of occurrence, and related physical processes. This course focuses on (1) the conceptual understanding of hydrologic processes, (2) the interaction between atmospheric, surface, and ground water regimes, and (3) an introduction to quantitative analysis. Course topics include the global hydrologic cycle, physical properties of water, aquifer and groundwater systems, surface water and watershed analysis, and introduction to quantitative techniques. Class lab exercises are designed as skill-building tools that promote the use of current computer technologies with a special emphasis on hydrologic data collection and analysis.

REQUIRED TEXT:

Viessman, W., and Lewis, G.L., Introduction to Hydrology, 5th Ed.: Prentice Hall, ISBN 0-67-399337-X, 612 p..

ADDITIONAL READING:

Journal articles, text readings, and lab exercises, to be provided by the instructor.

THE PROFESSOR'S PHILOSOPHY ON UPPER DIVISION EARTH SCIENCE / GEOLOGY COURSES:

The upper division Earth Science / Geology course sequence is designed for mature, serious students who are willing to work hard, play hard, have fun, and learn in-depth skills / concepts in a professional academic setting. By default, our student population is very diverse with a wide array of skills, interests, and career goals. The student population ranges from serious Earth Science majors with focused career objectives, to Geology / Earth Science minors to Science Education majors. As such, the professor is charged with serving a diverse array of student interests and career goals in the most professional manner possible. The problem-solving and technical skills acquired via training in the Earth Sciences are highly valuable (and marketable), regardless of career track. Students are expected to actively participate in the learning process and make a significant contribution to the academic integrity of the Earth Science program at Western Oregon University. The ultimate goal of the program is to provide graduates with the academic skills that will enable them to be highly competitive in graduate school or the career marketplace. *GO TEAM!*

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 "ES476" 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 2 exams (Midterm, Final) and lab exercises. The following is a breakdown of evaluation points and letter grades:

Midterm Exam	100 pts
Final Exam	120 pts
Midterm Lab Portfolio	50 pts
Final Lab Portfolio	50 pts
Weekly Lab Participation	40 pts
TOTAL:	360 pts

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

Exams: Exams will be administered at evenly spaced increments throughout the semester; the final will be 20% comprehensive with test material drawn from throughout the term. Exams will largely consist of essay questions and homework-type problems. *Warning: the exams are very comprehensive and will likely require a full 2+ hours to complete, please plan accordingly*.

Make-Up Exams: Under NO circumstances will make-up exams be administered without prior arrangement (at least five days) and good reason. Please show up on exam day!

Class and Lab Assignments: Class and lab assignments will be worked BOTH during class time and outside of class time each week. You will have lab, reading, and homework assignments that **may** take up to 3 or 4 hours to complete outside of class time, maybe more in some cases, depending on your skill levels and ability. Please plan your schedule accordingly. Due dates for class exercises will be prescribed by the instructor. Late work will be accepted up to 1 week after the due date, but will be automatically assessed a penalty of -20% of the point total.

Due to the volume of students assigned to the instructor each term, he will not be able to grade the lab exercise work in detail. The homework and lab 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. Exercise answer keys will be posted on the class web site by the instructor. **It is your**

responsibility to: (1) check your work against the lab / homework keys, (2) make sure you understand how to complete the exercises, (3) find help if you have trouble with lab exercises, and (4) study / learn the exercise skills and material for the exams.

A NOTE ABOUT INCOMPLETES: No incomplete grades will be given during the last week of class. If you have a problem that warrants an incomplete, make arrangements prior to the last week (no exceptions!!).

FIELD TRIP(S):

Local field trips and field exercises may be scheduled during the term as time permits. Please be aware that additional scheduling and personal time may be required as the course develops. Field trip ideas include travel to hydrology-related seminars at Oregon State University.

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 information to cover in a relatively short period of time. Please note that most upper division text books are geared for courses at universities with a 16 week semester system (i.e. we are truly trying to pack 10 gallons of water in a 5 gallon bucket). 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! **Plan your schedule accordingly!**

A SPECIAL NOTE ABOUT LAB EXERCISES:

Lab exercises will be quantitative in nature with an expectation that students have or will develop skills in the areas of applied algebra, trigonometry, and introductory calculus. Students will learn computer applications with emphasis on data analysis and problem solving in the hydrologic sciences. As such, lab exercises will require an additional time commitment outside of the scheduled weekly meeting (i.e. you will have "homework" and "projects" to work on outside of the scheduled class time).

Lab Exercise Portfolio:

The lab exercises represent a significant component of the class. Exercises are based on scientific observation, data analysis, and problem solving. Students will compile a Lab Portfolio consisting of a well-organized 3-ring binder with completed lab exercises. Students will complete approximately one (1)

lab exercise per week of the term. At the beginning of the term obtain a 2.5-inch thick three-ring binder with "see-through" plastic slip cover. Also include tab-separation sheets (three-hole punched), with stick-out tabs that can be clearly labeled. Create a professional-looking binder cover and insert it into the plastic slip cover.

Lab entries will be checked for completeness at the prescribed due date. A check-list will be maintained to reward those students who are responsibly completing the assignment on time. It is important to complete assignments on schedule, as the assignments are designed to help students understand lecture concepts and aid in successfully passing the exams. Lab Portfolio Part 1 will be submitted for comprehensive review and grading at the mid-term (this will include all labs and assignments completed prior to the mid-term exam). Lab Portfolio Part 2 will be submitted for comprehensive review during finals week (this will include all labs and assignments completed during the term).

Weekly Lab Participation

ES476/576 Hydrology is a course that emphasizes hands-on activities and skill building. It is not a traditional “lecture” course, but one in which students are expected to actively engage inquiry-based learning with their peers and instructor. Successful completion of the course is based on in-class student participation and collective interaction. As such, student work activities and progress will be checked at the end of each three-hour class period. Students will be assigned weekly lab activities with an introduction and overview of required methodology. Progress on weekly assignments will be assessed at the end of each class period, beginning in the last twenty-minutes of the class. Assessment will involve one-on-one debriefing with the instructor and clear demonstration of student achievement. Four points per week are available to students who demonstrate adequate weekly progress on their in-class assignments (a total of 40 points for the term). Students who are absent or leave class prior to the last twenty minutes without instructor assessment will receive a “zero”.

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.

TENTATIVE CLASS SCHEDULE: This outline should be considered tentative at best. The following schedule may be modified as class ideas evolve throughout the term.

Week	Dates	Class Content	Reading
1	Jan. 3	Lecture: Class Introduction, Hydrologic Systems, Hydrologic Cycle, Global Water Budget *In-Class Lab: Intro to Quantitative Applications*	Viessman Chap 1, 2 Waltham Chap 1 (handout)
Homework assignment – Week 1: Print out all of the course notes available on the class web site and organize them in a three-ring binder. Class note binders will be checked Jan 16.			
2	Jan. 16	Lecture: Physical and Chemical Principles *In-Class Tutorial: Intro to MS Excel as a Tool for Hydrologic Analysis*	Viessman Chap 3 Waltham Chap 3 (handout)
Homework: Intro to Applied Problems in Hydrology			
3	Jan. 23	Lecture: Atmospheric Processes/Precipitation *In-Class Lab: Analysis of Oregon Climate Data*	Viessman Chap 3, 4 Dingman p. 105-140
Homework: Intro to Contouring and Precipitation Maps			
4	Jan. 30	Lecture: Surface Water-Watersheds-Rivers I *In-Class Tutorial: Introduction to Surfer Raster-Based Mapping Software*	Viessman Chap 8 Surfer Tutorial (handout)
Homework: Cascade Mountain Ice Budgets			
5	Feb. 6	Lecture: Surface Water-Watersheds-Rivers II *In-Class Lab:Techniques in Watershed Analysis*	Viessman Chap 9
Homework: Flood Frequency and Drainage Basin Analysis			
6	Feb. 13	Mid-Term Exam Week (Exam 1) **Open Lab Period** **Last day to drop class without grade penalty**	
7	Feb. 20	Lecture: Introduction to Groundwater I *In-Class Lab: Hydrogeologic Problem Solving*	Viessman Chap 7, 10
Homework: Groundwater Problem Set 1			
8	Feb. 27	Lecture: Groundwater II; Flow Mechanics *In-Class Lab: Application of Surfer to Groundwater Hydraulics*	Viessman Chap 7, 10
Homework: Groundwater Problem Set 2			
9	Mar. 5	Lecture: Groundwater III; Well Hydraulics *In-Class Lab: Well Hydraulics / Aquifer Testing Using Aqtesolv Software*	Aqtesolv Tutorial (handout) Reading / Handout
Homework: Well Hydraulics / Aquifer Testing			
10	Mar. 12	Lecture: Water Resources Management	Viessman Chap 13
Open Lab and Homework Schedule: Compile Final Portfolios			Reading / Handout
11	Mar. 16	EXAM 2	