HYDROLOGY AND WATER RESOURCES – GEOG 425/525

Fall 2014 Term, University of Oregon
Course Registration Number: GEOG 425 – 12649, GEOG 525 – 12663
Lecture: 2:00pm – 3:20pm Mondays & Wednesdays, 201 CON
Instructor, Mark Fonstad, Condon 107F, fonstad@uoregon.edu, 541-346-4208
Instructor Office Hours: Mondays & Wednesdays 3:30pm – 4:00pm

Geography 425/525 provides an introduction to hydrology, which is the study of the distribution, timing, availability and management of water resources. The course is organized around the hydrologic cycle, with units such as precipitation, runoff, evapotranspiration, subsurface flow, and storage. An entire course or courses could easily be taught on any one of the topics above, so by default this will be a broad-based survey. You will develop a broad understanding of general topics related to fresh water resources and will have the ability to discuss with water specialists some of the key assumptions inherent in their methods and recommendations. This is a good course for a future manager who works with experts in water resources. By-and-large, however, this will *not* be a class where you develop specialized skills in any one subfield of hydrology such as open channel flow or groundwater transport, so do not expect to be a hydraulic engineer or expert in groundwater hydrology at the end of the quarter. If portions of this class catch your fancy, I can help direct you to specialized classes on these specific topics within our department or elsewhere across campus.

In this course you will study and apply some quantitative models in hydrology. Calculus is not required, but you must be comfortable with algebra and spread sheet skills (you will likely use Excel extensively). Participation and questions are strongly encouraged during class time.

REQUIRED READINGS

The required textbook is Hydrology and the Management of Watersheds, 4th Edition, by Brooks, Ffolliott, and Magner. The UO library has an e-textbook edition of this textbook. The library staff has told me that if you go through the library catalog and select this textbook for viewing (you'll need to login as a UO student), you should be able to view the textbook without problems, and print out pages as you desire. Should you want a print version of the textbook, they are available on Amazon and similar websites. Other readings will be distributed in class.

REQUIRED BACKGROUND

To enroll in this class you must have taken MATH 111 and either GEOG 321 or GEOG 322. If you do not have these prerequisites or have permission from me to override them, you should withdraw from this course.

EXERCISES

Exercises provide practical experiences for completing hydrologic analyses, and thinking through complex water resources issues. As there is no dedicated lab section for this class, the individual exercises have been designed to be take-home exercises. You are free to work with others on these exercises, but make sure that you do your own calculations and your own write-

ups for these exercises. Do not copy each others' written answers. Unless otherwise stated, I expect all answers to be written in complete sentences with all words correctly spelled. In the Schedule at the end of this syllabus, there are specific dates for when each exercise will be introduced, and for when each is due. Exercises must be turned in to me by the class period noted – otherwise you will receive a ZERO on that assignment unless you have made arrangements with me beforehand. It is essential that you complete the exercises because many of them build on knowledge you have gained from a previous exercise. You are also welcome to use the SSIL lab to complete the exercises.

GRADES

There will be two exams in the class (a midterm and a final exam), each worth 30% of your total grade. Both are closed-note/closed-book. Exercises will make up the remaining 40% of the grade for undergraduates (There are 8 exercises, each worth 5% of the total grade). Exercises will make up 20% of the grade for graduates (each exercise is worth 2.5% of the total grade). In addition, graduate students will produce an applied watershed project that makes up 20% of their grade. This project will comprise a hydrologic analysis of a basin, a significant write-up of what was done, why it was done, and how well it worked. The final grade scale is as follows: A+: >98; A: 92-98; A-: 90-92; B+: 88-90; B: 82-88; B-: 80-82; C+: 78-80; C: 72-78; C-: 70-72%; D+: 68-70; D: 62-68; D-: 60-62; F: <60.

ACADEMIC DISHONESTY

I *will not* tolerate cheating or academic misconduct/dishonesty in my courses; examples of these behaviors include (but are not limited to):

- Plagiarism (passing off the work of another as that of your own)
- Copying answers from your neighbors during exams/activities
- Dishonesty concerning reasons for absence from class
- Any other actions that might give you an unfair advantage over your classmates.

All cases of academic dishonesty/misconduct will be referred immediately to the Student Judicial Affairs Office. The penalties for engaging in academic dishonesty and/or misconduct can range from a grade of "F" for an assignment to an automatic failure of the course. Please consult the university policy at http://studentlife.uoregon.edu/judicial/conduct/sai.htm.

LATE/MAKE-UP WORK

Late exercises will not be accepted and make-up work will not be assigned, except in extreme circumstances and where you have documentation (i.e. doctor's note). If you must miss an exercise due date or exam due to illness or other unavoidable circumstances, you **MUST** notify the instructor prior to missing if at all possible.

DISABILITY SERVICES NOTICE

I work hard to ensure a quality learning experience for all students. If you need specific accommodations to get the most out of this class, please let me know by (1) informing me of your particular needs, and (2) providing the appropriate documentation from the campus

learning services office. I will make every effort to accommodate your needs, but you must notify me by the first week of class if you need special arrangements.

NOTE: I consider this syllabus a contract between myself and the students in this course. In writing this syllabus, I have obligated myself to follow the policies and procedures contained herein. You are responsible for understanding and following these policies as well. I reserve the right to make changes to this syllabus. You will receive verbal and written notification of major changes to course policies, procedures and content.

TENTATIVE SCHEDULE (Subject to change)

DATE	TOPIC	READINGS DUE	EXERCISE
29-Sep	Hydrology and Water Resources Intro	--	
1-Oct	Water Budgets: Concepts and Applications	Chap 1	
6-Oct	Water Budgets: Concepts and Applications	Chap 2	Ex. 1 Intro
8-Oct	Water Budgets: Concepts and Applications	Chap 2	
13-Oct	Atmospheric Water	Chap 3	Ex. 1 due, Ex. 2 Intro
15-Oct	Interception and Evapotranspiration	Chap 4	
20-Oct	Interception and Evapotranspiration	Chap 4	Ex. 2 due, Ex. 3 Intro
22-Oct	Water in Plants and in Soil, Drought	Chap 5	
27-Oct	Introduction to Groundwater	WS-2220	Ex. 3 due, Ex. 4 Intro
3-Nov	MIDTERM EXAM		
5-Nov	Groundwater & Surface Exchange	Chap 7	Ex. 4 due, Ex. 5 Intro
10-Nov	Streamflow Measurement and Analysis	Chap 6	
12-Nov	Streamflow Measurement and Analysis	Chap 6	Ex.5 due, Ex. 6 Intro
17-Nov	Floods and Floodplain Modeling	Chap 6	
19-Nov	Basins, Sediment, and River Channels	Chap 8	Ex. 6 due, Ex. 7 Intro
24-Nov	Basins, Sediment, and River Channels	Chaps 9	
26-Nov	Water-Quality Characteristics	Chap 11	Ex. 7 due, Ex. 8 Intro
1-Dec	Dams and other Hydrological Structures	Graf, 1999	
3-Dec	Tools and Emerging Technologies	Chap 16	Ex. 8 due
10-Dec	FINAL EXAM, 2:45pm – 4:45pm		