HYDROLOGY

GEOG 414/514, FALL, 2004
T, R 14:00-15:50, 413 Cramer Hall

Instructor: Dr. Heejun Chang Office: 424-I Cramer Hall Office Phone: 725-3162
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Course webpage: http://www.web.pdx.edu/~changh/hydro.html

CLASS CONTENT

This course provides an introduction to hydrology, with a focus on surface processes and watershed responses. We will cover topics ranging from precipitation, evapotranspiration, infiltration, runoff, stream processes, sediment budget, to human impacts on the hydrologic cycle. The course will deal with both pure and applied aspects of hydrology, with a mixture of both descriptive and quantitative methods. Knowledge in advanced physics or calculus is not required, but students are expected to be able to use fundamental math, algebra, and spread sheet skills. The format of the course will be a combination of lectures and discussion. Lectures do not merely repeat the contents of the textbook. I will highlight key concepts and processes of the hydrologic cycle, with supplementary materials from recent literature in hydrology. There will also be several recent articles for class discussion. You are strongly encouraged to attend and participate in the class since much of the lecture/discussion materials are not covered in the textbook.

TEXTBOOK

Required

Ward, A.D. and Trimble, S.W. 2004. *Environmental Hydrology* (2nd ed). Lewis Publishers. 475 p.

Recommended

Dunne, Thomas, and Leopold, Luna B., 1978, *Water in Environmental Planning*: W. H. Freeman and Co., San Francisco, 817 p.

Black, Peter E. 1996, *Watershed Hydrology*, (2nd edition), Lewis Publishers, 460 p.

Dingman, S. Lawrence, 2002, *Physical Hydrology*, Prentice Hall, New Jersey, 575 p.

GRADES

	Undergraduate	Graduate
Exams (Mid-term and Final)	40%	30%
Assignments (4 assignments)	40%	30%
Presentation (summary and discussion)	10%	7.5%
Article and book reviews	10%	7.5%
Term paper (literature review or research paper)		25%

There are no make-up exams unless you have official documents explaining your absence. In case of emergency, you must let me know your situation in advance. You must hand in the assignment before class on due date. No late assignment will be accepted. Presentation

involves in both oral presentation and leading discussion on a given topic. There are one article and book reviews. Undergraduate and graduate students will be graded separately.

GRADING SCALE

Letter Grade	Range	Interpretation
A A-	95 – up 90 – 95	Excellent understanding of principles, processes and terminology; outstanding effort
B+ B B-	87 – 90 83 – 87 80 – 83	Very good understanding and effort
C+ C C-	77 – 80 73 – 77 70 – 73	Good understanding and effort. This is the level expected of all students with average effort
D+ D D-	67 – 70 63 – 67 60 – 63	Poor understanding and effort. Student is not reaching the level of understanding and effort expected of the class, but not bad enough to fail.
F	Below 60	Failure. Little or no understanding and effort

LECTURE SCHEDULE

Week	Date	Topic	Activities	Reading + Journal articles*
1	9/28 – 9/30	Introduction The hydrologic cycle		p.1-6 p.10-25
2	10/05 – 10/07	Precipitation		p.29-50
3	10/12 – 10/14	Evapotranspiration	Assignment # 1 due (10/12)	p.83-116
4	10/19 – 10/21	Infiltration and soil water process	Assignment # 2 due (10/21)	p.55-79
5	10/26 – 10/28	Runoff Mid-term exam (in class)		p.119-129
6	11/02 – 11/04	Runoff	Assignment # 3 due (11/04)	p.129-159 p.
7	11/09 – 11/11	Stream processes Veteran's day observed	Article Review due (11/09)	p.161-177
8	11/16 – 11/18	Stream processes		p.177-205
9	11/23	Sediment budget	Assignment # 4 due (11/23)	p.272-289
10	11/30 – 12/02	Human impacts on the hydrologic cycle	Grad oral presentation Book review due (12/02)	p.339-358
11	12/06 (Mon)	Final exam (10:15-12:05)		

* Journal articles are available at http://psu-eres.lib.pdx.edu/courseindex.asp

ORAL PRESENTATION

The purpose of an oral presentation is to introduce the topic and summarize key findings of others' work. Papers selected are supplementary of the text and do not necessarily repeat the contents of the text. You are expected to summarize and lead the discussion of the paper for up to 25 minutes. To help facilitate students' understanding of the subject, introduce the background of the author(s)' research, followed by major findings of the paper. Power point presentation is strongly recommended. I will grade your presentation based on timeliness, structure, and contents of your presentation.

ARTICLE (BOOK) REVIEW

The article review should be double-spaced with two page maximum (font size 12, at least 1 inch margin). Some important components of the review are listed as follows. Make neat paragraphs and do not simply list and repeat the following components.

1) Appropriate citation (author, year, title, journal name, volume, page)

Jones, J.A. 2000. Hydrologic processes and peak discharge response to forest removal, regrowth, and roads in 10 small experimental basins, western Cascades, Oregon. *Water Resources Research* 36 (9):2621-2642.

2) Problem statement
- What questions the author(s) try to answer? What are the hypotheses?
- What goals and objectives are found in the article?
- Is this an important or a novel question?

3) Data/ Methods
- What kinds of data were used? Did the author(s) collect the data?
- What method was used? Is this an innovative or a new method?

4) Results
- What are the findings of the article? - What is most surprising?

5) Your own evaluation of the article
- Did the author(s) answer the hypotheses?
- Were the data enough to support the hypotheses?
- Was the method employed appropriate to answer the research questions?
- What do you find most interesting about the article?
- What remains unanswered?
- Would you like to replicate some of the approaches adopted in the article? If not, how would you like to approach differently?