

Earth and Planetary Sciences 116: Hydrology

Fall 2018

Professor: Margaret Zimmer, Assistant Professor
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Lecture meetings: Tuesday & Thursday, 8:00-9:35 am in E&MS D250
Laboratory location: E&MS D250 and in the field

Exams (closed-book): **Midterm # 1 – Thurs, 10/18, 8:00-9:35**
Midterm #2 – Tues, 11/13, 8:00-9:35
Final - cumulative, Tues 12/11, 4:00-7:00

Grades/Evaluations are to be based on the tests, labs, class participation, and assignments:

- 25% Labs
- 25% Problems sets
- 25% Midterms
- 20% Final
- 5% Class participation/demonstration of improvement over quarter

Required texts: Clausen, 2018, Introduction to Water Resources
Mount, 1995, California Rivers and Streams
All other required reading materials will be provided on Canvas.

Course website: All materials (lecture notes, homework, supplementary readings, etc.) will be provided through the course website. It is expected that students will regularly access the website, so students are responsible for information posted on the site.

Course objectives

- To be able to delineate and define watersheds and their boundaries.
- To understand the distribution and movement of water through hydrologic systems.
- To measure/acquire and analyze hydrological and meteorological watershed data.
- To quantify components of the hydrological cycle within a watershed, including precipitation, evapotranspiration, surface runoff, and groundwater flow.
- To understand the processes governing fluid motion.
- To identify and quantify the pathways by which water moves through catchments.
- To understand the application of watershed hydrology to management strategies.

Expectations

- The lecture will begin on time every week. Please be prompt.
- Be prepared for lectures by reviewing the textbook beforehand. If concepts are unclear, ask questions in class and visit with instructor or teaching assistant during office hours.
- All labs and problem sets will be due at the beginning of class. In some cases, we will go over assignments in class on the day they are due. For this reason, homework will not be accepted late without prior permission, and 10% will be deducted for every day after the due date that an assignment or lab is turned in. No materials will be accepted by email.
- All work turned in for grading should be neat and easy to read. Copy calculations for clarity, if needed, showing all necessary steps. All plots should be generated using a computer. Text answers should be typed where possible and practical.
- Each student is responsible for completing their own work, but you are encouraged to work in groups and help one another. You are also encouraged to use the resources available to you, including the textbook, the internet, and supplementary materials. That being said, your homework should not be copied directly from other individuals or from other materials.
- Please do not use cell phones during class.
- Any acts of plagiarism, cheating, etc. will result in a grade of zero for the work submitted, as well as other possible academic actions.

Special Accommodations

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At this time, I would also like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.

Course schedule and reading assignments; Subject to revision throughout the quarter

Date	Lecture topics	Lab	Readings/Problem Sets
Week 1 Thurs, 27 Sep Tues, 2 Oct Thurs, 4 Oct	1. Introduction 2. Water cycle 3. Budgets 4. Water properties 5. Stats, probability	Lab 1 3-4 Oct	Clausen, C 1, C 2 and C 3 Nelson, 1997 Reisner, C 1 and C 2 Specter, 2006 Dingman, App. A & App. B(536-548) Dunne and Leopold, C 2 (42-48) Taylor, 1997 C5.3-5.4 Hand out PS #1
Week 2 Tues, 9 Oct Thurs, 11 Oct	1. Atmospheric water 2. Precipitation 3. Interception 4. Evaporation 5. Transpiration	Lab 2 10-11 Oct	Clausen, C 4, C 5, C 6 Rantz, 1971 Dunne and Leopold, C 2-5 Mount, C 8 Hand in PS #1, hand out PS #2
Week 3 Tues, 16 Oct Thurs, 18 Oct	1. Infiltration Thurs, 18 Oct MIDTERM EXAM	Lab 3 17-18 Oct	Clausen, C 7 Dunne and Leopold, C 6 Dingman, C 6 (220-233) Dingman, C 6 (243-248) Hand in PS #2, hand out PS #3
Week 4 Tues, 23 Oct Thurs, 25 Oct	1. Soil moisture 2. Groundwater	Lab 4 24-25 Oct	Clausen, C 8 Dingman, C 6 (220-233 & 243-248) Hand in PS #3, hand out PS #4
Week 5 Tues, 30 Oct Thurs, 1 Nov	1. Runoff	Lab 5 31 Oct-1 Nov	Clausen, C 9 Dunne and Leopold, C 9 Hand in PS#4, hand out PS #5
Week 6 Tues, 6 Nov Thurs, 8 Nov	1. Hydrographs	Lab 6 7-8 Nov	Clausen, C 9 Mount, C 5 Hand in PS #5, hand out PS #6
Week 7 Tues, 13 Nov Thurs, 15 Nov	1. Floods/ flood routing Tues, 13 Nov MIDTERM EXAM	No lab	Mount, C 14 Hand in PS #6, hand out PS #7
Week 8 Tues, 20 Nov Thurs, 22 Nov	1. Stream-ground water interactions No class Thurs, 22 Nov (Thanksgiving)	No lab	USGS Circular 1139 (Introduction through Chemical interactions, pages 1-32) Harvey and Wagner, C 1 Hand in PS #7, hand out PS #8
Week 9 Tues, 27 Nov Thurs, 29 Nov	1. Water quality 2. Ecohydrology	Lab 7 28-29 Nov	Clausen, C 10, C 11 and C 18 Hand in PS #8, hand out PS #9
Week 10 Tues, 4 Dec Thurs, 6 Dec	1. Emerging topics in hydrology 2. Exam review	No lab	TBD Hand in PS#9
Tues 12/11, 4:00-7:00	FINAL EXAMINATION		