Earth and Planetary Sciences 116: Hydrology
Fall 2019

Professor: Margaret Zimmer, Assistant Professor
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E&MS A305
831-503-8714
Office Hours: Tues 1:00-3:00pm
(or by appointment; e-mail in advance)

TA: Amanda Donaldson
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Office Hours: Mon 9:00-10:00am in E&MS A170
(or by appointment; e-mail in advance)

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 – Tues, 11/5, 8:00-9:35**
Final - cumulative, Wed 12/11, 12:00-3:00pm

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

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

Required texts: Ward, 2016, Environmental Hydrology (Third Edition)
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.
- 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.

Classroom accessibility for everyone
You may make audio recordings of lectures, take pictures of the board, have food or beverages, leave the classroom when necessary, etc. If there is something I can do to create a more comfortable learning environment for you, please don't hesitate to ask, even if you're not registered with Student Accessibility Services. In the same vein, please be respectful of your fellow students and avoid interrupting classmates, bringing strong smells or common allergens to class, and blocking the aisle/doorway.

Digital Devices
Feel free to use a digital device (laptop, cell phone, etc.) to take notes or research material related to the class topic. If your digital device use is not for class purposes, please refrain from use.

Commitment to diversity, equity, and inclusion
I am committed to making the classroom a place that enhances all students' learning, a place where students are both respected and challenged. To the best of my abilities, I seek to make pedagogical choices that advance this goal. My commitment to this does not mean I think I am perfect; all of us make mistakes. I will do my best to acknowledge these, along with my privilege and biases; I ask that you do the same. This is not easy and it can be uncomfortable. I recommend using "ouch and educate" as a way to let your peers know that you are hurt and why. UCSC is our community and it is up to each of us to make it a safe and welcoming place for all to learn and succeed.

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

Date	Lecture topics	Lab	Readings/Problem Sets
Week 1 Thurs, 26 Sep Tues, 1 Oct Thurs, 3 Oct	1. Introduction 2. Water cycle 3. Budgets 4. Water properties 5. Stats, probability	Lab 1 2 Oct	Ward, C 1 Units/Digits Handout Data Retrieval/Plotting Handout **Hand out PS #1**
Week 2 Tues, 8 Oct Thurs, 10 Oct	1. Atmospheric water 2. Precipitation 3. Interception	Lab 2 9 Oct	Ward, C 2.1-2.8, 2.10 **Hand in PS #1, hand out PS #2**
Week 3 Tues, 15 Oct Thurs, 17 Oct	1. Evaporation 2. Transpiration	Lab 3 16 Oct	Ward, C 4.1-4.6 **Hand in PS #2, hand out PS #3**
Week 4 Tues, 22 Oct Thurs, 24 Oct	1. Infiltration 2. Soil moisture	Lab 4 23 Oct	Ward, C 3 **Hand in PS #3, hand out PS #4**
Week 5 Tues, 29 Oct Thurs, 31 Nov	1. Groundwater	Lab 5 30 Oct	Ward, C 11.1-11.3 **Hand in PS#4, hand out PS #5**
Week 6 Tues, 5 Nov Thurs, 7 Nov	**Tues, 5 Nov** **MIDTERM EXAM** 1. Runoff	Lab 6 6 Nov	Ward, C 5.1-5.3, 5.6 **Hand in PS #5, hand out PS #6**
Week 7 Tues, 12 Nov Thurs, 14 Nov	1. Hydrographs 2. Floods	Lab 7 13 Nov	Ward, C 5.4, 5.7, 5.11 C 7.1-7.2.1 and C 12.3 **Hand in PS #6, hand out PS #7**
Week 8 Tues, 19 Nov Thurs, 21 Nov	1. Stream-ground water interactions **No class Thurs, 21 Nov (Thanksgiving)**	No lab	USGS Circular 1139 (Introduction through Chemical interactions, pages 1-32) **Hand in PS #7, hand out PS #8**
Week 9 Tues, 26 Nov Thurs, 28 Nov	1. Water quality	Lab 8 27 Nov	Ward, C 12.8-12.10 **Hand in PS #8, hand out PS #9**
Week 10 Tues, 3 Dec Thurs, 5 Dec	1. Emerging topics in hydrology 2. Exam review	No lab	TBD **Hand in PS#9**
Wed 12/11, 12:00-3:00	**FINAL EXAMINATION**		