Recommended prerequisites: one course in physics or chemistry; one course in calculus or statistics

Course approach and goals: Most of the earth’s terrestrial surface is made up of watersheds, and hence an understanding of the way water moves in watersheds is an important key to understanding how many ecological and environmental processes function. This course investigates the primary ways in which hydrology works in a watershed, at a process level. The course introduces basic physical processes that control water movement both to the watershed in the form of precipitation and from the watershed in the form of streamflow and evapotranspiration, as well as within the watershed including the vegetation and the soils. Basic computational approaches are employed to solve hydrologic problems. The overall goal in this course is to provide students with a thorough grounding in the biophysical processes controlling hydrology in watersheds, and with an ability to use computational tools to solve hydrologic problems.

Learning objectives:

• To understand basic physical processes controlling water movement to, from, and within watersheds
• To understand how to construct water balances and how to use water balance approaches to solve unknowns in hydrologic problems
• To understand how precipitation is delivered to watersheds and how to estimate it spatially
• To understand the basic process controlling water in soils and how water infiltrates soils
• To understand how water moves within plants and how water transpires from plants and evaporates from watershed surfaces
• To understand how streamflow is generated from watersheds and understand how to interpret a streamflow hydrograph
• To understand how to use computational tools to solve basic watershed hydrology problems
• To understand how hydrology is relevant in the world today by exploring hydrology in the news

Schedule:

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<th>Activity/Item Due</th>
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<td>Sep 29, Oct 1</td>
<td>Basic Concepts (Ch 1)</td>
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<td>Global Hydrology (Ch 2)</td>
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<td>Dec 8, 10:15</td>
<td>Final exam</td>
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Reading assignments:

Sections to be read from each chapter will be assigned on D2L. Students are responsible for having read this material prior to it being presented in lecture.

Hydrology in the News essay/presentation:

Each week 3-4 students will select a news event related to hydrology that week, and write a one page essay about that item. The essay should have proper essay format (i.e. have a meaningful title, a topic sentence, a body and a conclusion sentence – suggest using just a single paragraph). On the day of presentation, each person will give an informal 3-5 min talk (i.e. no powerpoint is required, but you may use props or a single powerpoint slide if you so choose) about the news event, and take 1-2 questions from the class.

Grade components:

- Grade computation is: Participation 10%, Essay/Presentation 10%, Homework 30%, Midterm exam 25%, Final exam 25%.
- The participation grade is based on attendance, timely completion of assignments, and active participation in class discussion.
- The essay/presentation grade is based on an essay on a current hydrologic news item, and brief oral presentation of it (see guidelines for more details).
- Graded homework sets will be returned with detailed solutions for you to check your answers and to better understand the problems. HW sets handed in late may receive some partial credit, but no more than 50%.
- Exams are closed-book. Prior to each exam, there will be some in-class review; however, no exam review sheets will be distributed. Students are responsible for knowing all assigned readings, lecture notes and homework sets that pertain to that exam.

Resources:

Hydrologic links

Check out the following www sites for information and data relevant to hydrology:

USGS Water Center: http://www.usgs.gov/water/
National Hydrographic Dataset: http://nhd.usgs.gov/
National Weather Service: http://www.weather.gov/
HJ Andrews Experimental Forest: http://www.fs.fed.us/pnw/exforests/hjandrews/

General student information:

All Students

Don’t forget to check out the ESM department and School of Environment webpages: http://www.pdx.edu/esm/
http://www.pdx.edu/environment/

Library Research Tutorials: [http://guides.library.pdx.edu/home/howto](http://guides.library.pdx.edu/home/howto) and [http://guides.library.pdx.edu/biology](http://guides.library.pdx.edu/biology)

**Safe Campus:** If you have not done so already, please complete the Safe Campus Module in D2L. The module should take approximately 30 to 40 minutes to complete and contains important information and resources. If you are uncomfortable completing the module, please send an email to saveact@pdx.edu to request an exemption. If you or someone you know has been harassed or assaulted, you can find the appropriate resources at Sexual Misconduct Prevention & Response: [www.pdx.edu/sexual-assault/](http://www.pdx.edu/sexual-assault/). PSU's Student Code of Conduct makes it clear that violence and harassment based on sex and gender are strictly prohibited and offenses are subject to the full realm of sanctions, up to and including suspension and expulsion. [http://www.pdx.edu/sexual-assault/safe-campus-module](http://www.pdx.edu/sexual-assault/safe-campus-module)

**Learning Center/Free Tutoring:** [http://www.pdx.edu/tutoring/](http://www.pdx.edu/tutoring/) PSU library rm 245

**Writing Center:** for class assignments, resumes... [http://www.writingcenter.pdx.edu/](http://www.writingcenter.pdx.edu/) Cramer rm 188 Please consult the Purdue OWL regarding plagiarism and other writing issues: [https://owl.english.purdue.edu/owl/resource/589/01/](https://owl.english.purdue.edu/owl/resource/589/01/)

**Math:** [https://www.pdx.edu/math/math-resource-lab/](https://www.pdx.edu/math/math-resource-lab/); Department of Mathematics and Statistics provides free tutors for lower division algebra, calculus and statistics: [https://www.pdx.edu/math/resources](https://www.pdx.edu/math/resources)

**Disability Resource Center:** If you are a student with a documented disability and are registered with the Disability Resource Center, please contact me so that we can arrange whatever academic accommodations you need.

**Veterans:** If you are a Veteran and have questions about University services or need assistance with your transition from military to campus life, please contact Chris Goodrich, Coordinator of Veterans Services at the Office of Veterans' Services, SMSU room 425.

**Multicultural Centers:** [https://www.pdx.edu/dmss/multicultural-student-center](https://www.pdx.edu/dmss/multicultural-student-center); [https://www.pdx.edu/dmss/native-american-student-community-center](https://www.pdx.edu/dmss/native-american-student-community-center); [https://www.pdx.edu/dmss/lacasa-latina-student-center](https://www.pdx.edu/dmss/lacasa-latina-student-center)

**Queer Resource Center:** [www.pdx.edu/queer](http://www.pdx.edu/queer)

**Undergraduate Students**

See the ESM www site for scholarship opportunities.

LSAMP (Louise Stokes Alliance for Minority Participation) is dedicated to enhancing the undergraduate experience for underrepresented students in Science, Technology, Engineering, and Mathematics. Funded by the National Science Foundation, our LSAMP program focuses on: Creating a community among LSAMP scholars that values excellence, diversity, and persistence; and Expanding opportunities for LSAMP scholars through participation in undergraduate research experiences and leadership initiatives. If you're interested in finding out more, visit our LSAMP center in **103 Epler Hall**, talk to ESM-LSAMP
faculty advisory member Cat de Rivera <derivera@pdx.edu>, SRTC 238e, or check out: http://www.pdx.edu/lsamp/home

McNair Fellows program - for first-generation to college students as well as students from backgrounds underrepresented in the sciences.

EXITO - first year students interested in health-related disciplines (broadly defined) are encouraged to apply to the NIH-funded EXITO program spring of their freshman year: http://www.pdx.edu/undergraduate-pathways-to-research-careers/about-build-exito