

Where:	Remote Class via Zoom through Portland State University login
Lecture:	MW 1400-1550
Instructor:	Dr. Kelly Gleason (k.gleason@pdx.edu , office: SRTC B1-04D Office hrs: Tuesday 2-3pm, Thursdays 10-11am, or by appointment)
TA:	Lara Jansen (ljansen@pdx.edu , office: SB1 314, Office hrs: Mondays 11am-12pm)
Text:	We will use a variety of readings for this course available through the library and D2L.
Need:	Calculator, paper, and pencil. Excel, word, and powerpoint software access.

Portland State has been working diligently to address the health, safety, and well-being needs of the entire PSU community during the COVID-19 pandemic. Every effort is being made to provide an accurate and efficient flow of communication to all students, staff, and faculty. As questions and concerns arise, a multitude of campus resources are available to you. If you are ever unsure how to find a resource you need or want, explore the College of Liberal Arts and Sciences' website at pdx.edu/clas/covid-19-resources-for-students. Help is near. Reach out.

Remote Class Learning: Because of the current public health situation we have moved the course to remote learning, which means that all classes will be live via Zoom and available through a link posted to D2L in each week's materials. I will typically lecture for one hour, record the video in Zoom, and post the video in D2L for those of you who may need to access the lecture at another time. The second hour of class will be work time, spent doing the class exercises, and I will be available via live stream in Zoom to answer questions related to the assignments. Also, I will have remote office hours each week with a Zoom link posted to D2L where I will be available for live chat to discuss your assignments. Thank you for your patience and understanding throughout this difficult process. This class has been recently re-designed to emphasize hands-on and collaborative learning, which has all been changed to accommodate remote learning. This course was not designed for online access, but I will do my best to guide your learning through these difficult and different times. Please help me by assisting others via D2L discussion boards.

Course Overview:

Water sustains life and society and drives numerous processes on our planet, so it is imperative we understand the processes that govern the water cycle and the occurrences of water on Earth. This course, Watershed Hydrology, is designed to introduce students to the Earth's water cycle and water resources management. It considers atmospheric, surface, biological, and groundwater processes, and guides students to develop critical hydrologic skills and foundational knowledge of watershed hydrology.

Learning Outcomes:

At the conclusion of the course, students will have a better understanding of how water moves through the environment and how humans modify the water cycle. This course will enable students to critically evaluate information from a process-based understanding, a skill transferable to other disciplines and parts of life. Students will engage in data collection, data analysis and description in effort to solve problems and integrate knowledge.

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

Materials and Resources:

Most course readings are from eBooks at the PSU library. All other course materials, such as labs, syllabus, data, and other assignments and readings, will be online on D2L or from the public internet. The two main course eBooks are:

- *Modern hydrology and sustainable water development*, by SK Gupta (2010)
- *Hydrology and the Management of Watersheds*, by KN Brooks, PF Ffolliott, and JA Magner (2012)

These are available on the PSU library website (see directions below).

1. Go to: <https://library.pdx.edu/> the PSU library homepage.
2. Paste the title of the book into the search box. Login to your PSU student account when prompted.
 - For *Hydrology and the Management of Watersheds*, there will be two eBook entries published in 2012. Either is fine. Clicking on one will take you to the *Ebook Library* and *Wiley Online Ebooks* links and the other will take you to the *ebRARY Academic Complete* link.
 - Clicking the *Modern hydrology and sustainable water development* ebook will take you to the *Wiley Online Ebooks* link.
 - From the *Wiley Online Ebooks* link you can easily download whole chapters as pdfs. But be sure to abide by copyright law and use only for your own personal educational purposes, do not copy, distribute, etc.
3. You may need to sign in with your PSU ID and pwd a second time to get through to the ebook itself.

Additional Readings will be made available each week through D2L for the following week.

Course Materials Needed

For this course, you will need:

- A willing, working learning spirit
- Scrap paper, pencils, erasers
- Access to the internet, PSU library, and D2L online
- Ample time outside of class to thoughtfully do weekly readings
- Ample time outside of class to finish working through the homework/lab assignments
- Word processor software access
- MS Excel software access
- Laptop computer*

*** It will greatly aid your progress on some lab assignments if you are able to bring a laptop to homework/lab working days (Wednesdays).**

Schedule (tentative and subject to change):

<u>Week</u>	<u>Dates</u>	<u>Lecture Topic (readings)</u>	<u>Workshop</u>	<u>Due Dates</u>
				<i>Reading in italics</i>
1	Mar 30 Apr 1	Intro to Hydrology, Water Cycle, Water Balance Units and Watersheds Workshop 1: Unit Conversions and Watersheds	HW1	Quiz 1 <i>Gupta Ch.1; BFM Ch.1</i>
2	Apr 6 Apr 8	Atmosphere, Humidity, and Thermodynamics Climate and Global Circulation Workshop 2: Water and Energy Balance	HW2	Quiz 2 HW 1 <i>BFM Ch.2</i>
3	Apr 13 Apr 15	Precipitation 1 Precipitation 2 Workshop 3: Precipitation and frequency analysis	<i>Speaker</i> HW3	Quiz 3 HW 2 <i>BFM Ch.3</i>
4	Apr 20 Apr 22	Snow Hydrology 1 Snow Hydrology 2 Workshop 4: Snow	<i>News</i> HW4	Quiz 4 <i>DW Ch.1</i> <i>Barnett et al., 2005</i> HW 3
5	Apr 27 Apr 29	Infiltration and Soil Moisture Runoff and Streamflow Workshop 5: Infiltration and Runoff	HW5	Quiz 5 HW 4 <i>BFM Ch.5</i>
6	May 4 May 6	Streamflow, Hydrographs, and Baseflow Streamflow, Discharge/Rating Curve Workshop 6: Streamflow, Runoff, and Discharge	<i>News</i> HW6	Quiz 6 <i>Dingman Ch10</i> HW 5 <i>BFM Ch. 6</i>
7	May 11 May 13	Evapotranspiration 1 Evapotranspiration 2 Workshop 7: Evapotranspiration	HW7	Quiz 7 HW 6 <i>BFM Ch. 4</i>
8	May 18 May 20	Groundwater Mid-term exam	<i>News</i> Mid-term	Quiz 8 <i>BFM Ch. 7</i> <i>Article</i> HW7
9	May 25 May 27	MEMORIAL DAY – NO CLASS Floods, Droughts, and Climate Change Workshop 8: Flood Frequency Analysis	HW8	<i>Article</i> Quiz 9 <i>BFM Ch.10</i>
10	June 1 June 3	Water Chemistry and Pollution Water Resources 525 Presentations	<i>News</i>	Quiz 10 <i>BFM Ch.11</i> 525 Projects HW8
11	June 8	Final exam or final presentations (12:30 pm - 14:20 pm)		

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.

425/525 Hydrology in the News essay/presentation:

Each week 4-5 students will select a news event related to hydrology being covered in class 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.

525 Final project essay/presentation:

Groups of 3-4 graduate students will select a LTER site (available at <https://lternet.edu/site/>). Answer an applied hydrology question by analyzing data from your LTER site, and write a 2 page report about your solution. The report should be in proper scientific format (i.e. have a meaningful title, a topic sentence, and body including introduction, methods, results and conclusions – suggest using just one paragraph for each section plus figures). During week 10 graduate students will present final project presentations, and each group will give a 10 min talk (i.e. use a powerpoint presentation with fewer than 5 slides) about the applied hydrologic analysis and take a few questions from the class.

Evaluation Criteria:

The quantitative learning evaluations total 230 points; see breakdown in table below.

The lowest lab grade and lowest four quiz grades per student will be dropped at the end of the semester.

Item	Points	Percent	Notes
Labs (8) @ 10pt ea	80	40%	Started in-class on Wednesdays, due at beginning of following lab.
Quizzes (10) @ 3pt ea	30	15%	Beginning of first class of each week, on assigned readings.
Midterm @ 40pt	40	20%	In-class exam – short answers, calculations, multiple choice.
Article Review (2) @ 10pt	20	10%	
Hydrology in the News @ 10pts	10	2.5%	
Participation	20	5%	
425 Undergraduate <i>Total</i>	200	100%	
Grad students: Final Project @ 50pt	50	20%	Exam, during or due at scheduled day/time of final.
525 Graduate <i>Total</i>	250	100%	

Grading notes:

% Grade	Letter
90-100	A
80-89	B
70-79	C
60-69	D

- Labs may be competed in groups, but each write-up must be done individually.
- Early or late exams or quizzes will not be offered.
- *Late homework/lab assignments: -25% for each class day late.*
- Homework/lab assignments should be typed as much as possible but calculations may be handwritten. Essays should be typed.

<60	F
-----	---

Note: Borderline grades (e.g.: 89.9) will be determined at the discretion of the instructor based on individual effort and class attendance.

Roles and Responsibilities: Students and Faculty

My expectations of each student are high. I ask you to:

- 1) *****Take responsibility for your own learning in this course***** It is YOUR learning.
- 2) Conduct yourself in a courteous and collaborative manner
- 3) Attend every class and lab on time
- 4) Be prepared each day
- 5) Think critically and ask questions
- 6) Be engaged in the course material and put *work* into your learning
- 7) Avoid use of internet-enabled devices during class (unless instructed to use)
- 8) Exhibit academic integrity

You can do this by reading assignments before lectures, integrating new concepts and terminology as the semester progresses, always keeping the big picture in mind, and recognizing that the details are vital to understanding. Be an active participant both verbally and intellectually.

For our part, we aim to keep grading clear and fair. Given the volume of email we receive, we cannot always respond promptly and concisely to each email -- it is best to talk to us after class, in lab, if office hours, or by appointment.

We will aim to keep lectures clear, learning objectives transparent, and be well-organized throughout the semester. We will return weekly labs and quizzes as soon as possible. The more clear and clean and correct your assignments are when you turn them in, the faster we will be able to grade them and return them to you! In sum, we aim to create a challenging but rewarding and fun class atmosphere to help you learn and grow conceptually and quantitatively.

Resources:

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/>

Natural Resource Conservation Service Hydrology & Hydraulics:

<https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/water/hydrology-hydraulics-hh>

HJ Andrews Experimental Forest: <https://andrewsforest.oregonstate.edu/>

LTER: <https://lternet.edu/>

Policies:

All Students

D2L: In this class I use D2L, a Web-based course management system with password-protected access at <https://d2l.pdx.edu/> Via D2L, I will distribute course materials, send emails, post grades, and administer assignments, quizzes, and surveys. You can find support in using D2L from the IT Help Desk. Please check D2L daily, as I will communicate important changes to assignments or the syllabus through D2L (in addition to in class).

Email: Please allow 48 hrs for me to respond via email. When emailing me about anything, please make clear subject lines including your name, the class, and the reason for your email, and I will respond as soon as reasonable.

Cheating or plagiarism in any form is unacceptable. Cheating includes, but is not limited to: copying work or allowing your work to be copied; use of unauthorized material during quizzes and exams; any communication between students during quizzes and exams, including take-home exams; actively looking at another student's paper during a quiz or exam. Plagiarism includes copying from or resubmitting homework from a previous semester, whether your own work or that of another, whether previously graded or not. Plagiarism also includes using laboratory data from another person [unless specifically instructed to share data] or from a previous semester. Any occurrence of cheating may be reported to the Office of Student Conduct. Reports of cheating, or suspected cheating, by classmates will be kept strictly confidential and anonymous to every extent possible. Cheating by classmates inflates grades and dilutes the value of ethical hard work. Cheating may incur various consequences, up to and including course failure.

Safety is a top priority in the classroom, lab, and field. Safety protocols will be presented and reviewed as necessary. Safety includes treating each other with respect.

Mandatory reporting notice: The instructor of this course is required to report any instance or suspicion of harassment or discrimination or intimidation, sexual or otherwise, observed first-hand or brought to the instructor's attention by a student. Please feel free, encouraged, and supported to report instances of harassment or discrimination or intimidation to the instructor. Confidentiality will be maintained to the degree possible while following university, state, and federal policies regarding reported behaviors or incidents.

Emergency Notification System: PSU has made an emergency notification system available for faculty, students, and staff, please register at <https://www.pdx.edu/emergency-management/psu-alert-emergency-notification-system>. Please register in Banweb with emergency contact information (cell, email, text, etc.). You may have been prompted to complete emergency contact information when registering for classes in Banweb. In the event of a building evacuation, a map at each classroom entrance shows the evacuation point for each building. Please refer to it. Individual class cancellations may be made at the discretion of the instructor.

Inclement weather policy: In the event that an adverse weather event (e.g., snow or ice) or natural hazard that poses a safety risk occurs, you should take personal safety into account when deciding whether you can travel safely to and from campus, taking local conditions into account. If campus remains open and your instructor decides to cancel the face-to-face meeting and substitute an alternative learning activity, you will be notified by your instructor via email or through D2L within a reasonable time after the decision to open or close campus has been made. Instructions regarding any alternative learning options or assignments will be communicated in a timely manner. If travel to campus is not possible due to adverse regional conditions, allowances to course attendance policy and scheduled assignments, including exams and quizzes, will be made. Students who attempt to gain advantage through abuse of this policy (e.g., by providing an instructor with false information) may be referred to the Office of Student Conduct for disciplinary action. If a student encounters an issue with an instructor, the student should first talk with the instructor. If the issue cannot be resolved, the student should follow the reporting violations of policies outlined on the student affairs website.

ESM department and School of Environment webpages: <http://www.pdx.edu/esm/>

Advising & Career Services:

<https://www.pdx.edu/careers/>

<https://www.pdx.edu/careers/what-can-i-do-degree-environmental-studies>

<https://www.pdx.edu/careers/what-can-i-do-degree-environmental-science>

Library Research Tutorials: <http://guides.library.pdx.edu/home/howto> and

<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/. 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>

Learning Center/Free Tutoring: <http://www.pdx.edu/tutoring/> PSU library rm 245

Writing Center: for class assignments, resumes... <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/>

Math: <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>

Disability Resource Center: Reasonable accommodations are available for students with documented disabilities or chronic medical conditions. **If you have a disability and need accommodations to fully participate in this class, please visit the Disability Resource Center. All disability related accommodations MUST be approved through the Access Center.** Students with approved accommodations are strongly encouraged to visit with instructors early in the semester during office hours to discuss logistics.

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/native-american-student-community-center> ; <https://www.pdx.edu/dmss/la-casa-latina-student-center>

Queer Resource Center: 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>