

Where: FMH 200, Portland State University and Zoom for recording lectures.
Lecture: Tuesdays AND Thursdays 10:00-11:50 am
Lab: Tuesdays OR Thursdays OR Fridays 2:00-5:50pm
Instructor: Dr. Kelly Gleason (k.gleason@pdx.edu; office: SRTC B1-04D; office hrs TBA)
Lab GTAs: Tris Kibbey (lead TA) for Lab 003 Thursday 2-5:50pm (tkibbey@pdx.edu; office hrs TBA)
Bria Bleil for Lab 004 Tuesday 2-5:50pm (briab@pdx.edu; office hrs TBA)
Sam Hall for Lab 005 Friday 2-5:50pm (hallsam@pdx.edu; office hrs TBA)

Required Text: *Skinner and Murck (2011). The Blue Planet: An Introduction to Earth System Science, 3rd Edition. Wiley. Available used and new online or at the PSU Bookstore*

Portland State University Land Acknowledgement:

Portland State University is located near the heart of downtown Portland, Oregon in Multnomah County. We honor the Indigenous people whose traditional and ancestral homelands we stand on, the Multnomah, Kathlamet, Clackamas, Tumwater, Watlala bands of the Chinook, the Tualatin Kalapuya and many other Indigenous nations of the Columbia River. In remembering these communities, we honor their legacy, their lives, and their descendants. It is important to acknowledge the ancestors of this place and to recognize that we are here because of the sacrifices forced upon them.

Catalog Course Description:

Structure and function of environmental systems, with an emphasis on physical processes and environmental system dynamics. Includes a laboratory section using quantitative techniques for conceptualizing and analyzing environmental processes.

Learning objectives:

1. Understand applications of basic physics in earth sciences
2. Quantitatively understand the movement of energy and material at the Earth's surface.
3. Apply this understanding to such concepts as basic hydrology, mass balances, and heat budgets.
4. Extend these concepts from smaller scales to global scales, such as climate change and meteorology.

Note: There will be algebraic math required in the workshop assignments for this course.

We will use **Canvas** to manage this course, an on-line learning system (<https://canvas.pdx.edu>). You need to use your ODIN user name and password to log in. Class materials such as syllabus, homework assignments, lecture PowerPoint presentations, grades, and extra readings will be posted in “Canvas”. Students are encouraged to use “Canvas” to post questions, comments, and suggestions. **Canvas’ email system works in a mysterious way and I strongly recommend that you don’t use Canvas to email me.**

ESM 320 – Fall 2023 Quick Schedule

Week 1 – Earth System Science

Tuesday: Intro to the class and earth system science

Thursday: Scientific Method, Hypotheses, Dimensions and Units

Reading: T. Ch. 1 p 6-22, R. Ch. 1 p 22-26, plus dimensions and units

Week 2 – Earth Properties

Tuesday: Energy and Matter

Thursday: Space and Time

Reading: T. Ch. 2 p 33-47, Ch. 3 p 54-55, R. Ch. 4 p 82-85, p 101-105

Week 3 – The Atmosphere

Tuesday: The Atmosphere

Thursday: Wind and Weather Systems

Reading: T. Ch. 11 p 322-335, R. Ch. 11 p 335-343

Week 4 – Wind, Weather, and Climate

Tuesday: The Climate System

Thursday: Global Circulation Patterns

Reading: T. Ch. 12 p 350-375, R. Ch. 13 p 380-384

Week 5 – The Hydrosphere

Tuesday: Hydrologic Cycle – precipitation and surface water

Thursday: Cryosphere

Reading: T. Ch. 8 p 224-240, R. Ch 9 p 258-281

Week 6 – The Hydrosphere

Tuesday: Groundwater

Thursday: Oceans

Reading: T. Ch. 8 p 240-252, R. Ch. 10 p 288-314

Week 7 – The Geosphere

Tuesday: Tectonics

Thursday: Earthquakes

Reading: T. Ch. 5 p 112-125, R. Ch. 6 p 144-160

Week 8 – The Geosphere

Tuesday: Volcanoes

Thursday: The rock cycle

Reading: T. Ch. 6 p 160-178, R. Ch. 7 p 186-216

Week 9 –MIDTERM on Tuesday and **NO CLASS** on Thursday for Thanksgiving

Week 10 – Climate Change and Changing Earth Systems

Tuesday: Climate Change

Thursday: Changing Earth Systems

Reading: T. Ch. 13 p 384-410, R. Ch. 19 p 574-602

ESM 323 – Lab Quick Schedule

1. Excel tutorial
2. On campus field trip - radiation lab 1
3. Prep for atmosphere field trip, map reading
4. Field trip – atmospheric temperature and pressure lab 2
5. Prep for hydrology/streamflow field trip, map reading, watershed delineation
6. Field trip – streamflow measurements lab 3

7. Article review – online recording for Veteran’s day
8. Data visualization – finish up lab 3 report
9. Midterm in ESM320 and Thanksgiving
10. Peer review of lab 3 report

ESM 320 – Detailed Schedule (tentative and subject to change):

Readings listed are for the 3rd edition of Skinner and Murck – The Blue Planet

<u>Week</u>	<u>Dates</u>	<u>Lecture Topic (readings)</u>	<u>Workshop</u>	<u>Due Dates</u> <i>Reading in italics</i>
1	Sep 26 Sep 28	Earth System Science Intro to Earth System Science Scientific Method, Hypotheses, Dimensions and Units <i>Homework 1: Earth Systems and Unit Conversions</i>	<i>News info</i> HW1	<i>SM Ch. 1</i> Quiz 1
2	Oct 3 Oct 5	Earth Properties Energy and Matter Space and Time <i>Homework 2: Energy and Matter, Space and Time</i>	<i>News</i> HW2	<i>SM Ch. 2, 3, 4</i> Quiz 2 HW 1
3	Oct 10 Oct 12	The Atmosphere The Atmosphere Wind and Weather Systems <i>Homework 3: The Atmosphere</i>	<i>News</i> HW3	<i>SM Ch. 11, 12</i> Quiz 3 HW 2
4	Oct 17 Oct 19	Weather and Climate Weather and Climate Global Circulation Patterns <i>Homework 4: Weather and Climate</i>	<i>News</i> HW4	<i>SM Ch. 13</i> Quiz 4 HW 3
5	Oct 24 Oct 26	The Hydrosphere Hydrologic cycle and Surface Water Cryosphere <i>Homework 5: The Hydrosphere</i>	<i>News</i> HW5	<i>SM Ch. 8, 9</i> Quiz 5 HW 4
6	Oct 31 Nov 2	The Hydrosphere Groundwater Oceans	<i>News</i>	<i>SM Ch. 8, 10</i> Quiz 6 HW 5
7	Nov 7 Nov 9	The Geosphere Tectonics Earthquakes <i>Homework 6: The Geosphere</i>	<i>News</i> HW 6	<i>SM Ch. 5, 6</i> Quiz 7
8	Nov 14 Nov 16	The Geosphere Volcanoes The Rock Cycle	<i>News</i>	<i>SM Ch. 6, 7</i> Quiz 8 HW6
9	Nov 21 Nov 23	MIDTERM EXAM Thanksgiving Holiday – NO CLASS		
10		Climate and Earth Change	<i>News</i>	<i>SM Ch. 13, 19</i>

	Nov 28 Nov 30	Climate Change Changing Earth Systems		Quiz 9
11	Dec 5	FINALS WEEK		

Note: The course is an in-person course, but we will be recording the live lectures via Zoom. The zoom classroom is available to those who are not able to attend in person, and the live lectures are recorded, but it is not technically an attend anywhere course, so instruction is not equal for in person and remote attendance for the course.

Reading assignments:

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

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 Canvas 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

GRADING

Evaluation Criteria:

The quantitative learning evaluations total 200 points; see breakdown in table below.

Item	Points	Percent	Notes
Homeworks (6) @ 20pt ea	120	59%	Started in-class on Thursdays, due before the following Thursdays.
Quizzes (9) @ 3pt ea	27	13%	Beginning of first class of each week, on assigned readings.
Midterm @ 40pt	40	20%	In-class exam – short answers, calculations, multiple choice.
Participation	13	2%	Attendance will be taken during class.
News	10	5%	5-minute in person presentation and writeup
<i>Total</i>	202	100%	

Grading notes:

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

Earth System News Essay/Presentation

Each week 3-4 students will select a news event related to hydrology that week, and write a one paragraph 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. You must include the link to the news source and the citation for the primary literature associated with this report. Some resources to get you started include, <https://yaleclimateconnections.org/>, and <https://eos.org/>

Homework and grading notes:

- Homework may be completed in groups, but each write-up must be done individually.
- Early or late exams or quizzes will not be offered.
- **Late homework assignments: -10% for each class day late, and up to one week late or -50% maximum.**
- Homework assignments should be typed as much as possible but calculations may be handwritten. Essays should be typed.

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 clearer and cleaner and more 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.

COVID POLICIES

Classroom Requirements for All Students and Faculty Due to Covid-19

The University has established rules and policies to make the return to the classroom as safe as possible. It is required for everyone to follow all the Return to Campus rules and policies. To participate in this class, PSU requires all students to comply with the following.

Vaccination

Be vaccinated against COVID-19 and complete the COVID-19 vaccination attestation form. Those students with medical or nonmedical exemptions or who will not be on campus at all must complete the process described on the “COVID-19 Vaccine Exemption Request Form” to establish those exemptions.

Health Check, Illness, Exposure, or Positive Test for COVID-19

Complete the required self-check for COVID-19 symptoms before coming to campus each day.

If you are feeling sick or have been exposed to COVID-19, do not come to campus. Call The Center for Student Health and Counseling (SHAC) to discuss your symptoms and situation at 503-725-2800. They will advise you on testing, quarantine, and when you can return to campus.

If you test positive for COVID, report your result to SHAC and do not come to campus. SHAC will advise you on quarantine, notification of close contacts, and when you can return to campus.

Please notify me (i.e. your instructor), should you need to miss a class period for any of these reasons so that we can discuss strategies to support your learning during this time.

If I become ill or need to quarantine during the term, either I or the department chair will notify you via PSU email about my absence and how course instruction will continue.

Failure to Comply with Any of these Rules

As the instructor of this course, the University has given me the authority to require your compliance with these policies. If you do not comply with these requirements, I may ask you to leave the classroom, or I may need to cancel the class session entirely.

In addition, failure to comply with these requirements may result in a referral to the Office of the Dean of Student Life to consider charges under PSU's Code of Conduct. A student found to have violated a university rule (or rules) through the due process of student conduct might face disciplinary and educational sanctions (or consequences). For a complete list of sanctions, see Section 14 of the Student Code of Conduct & Responsibility.

Guidance May Change

Please note that the University rules, policies, and guidance may change at any time at the direction of the CDC, State, or County requirements. Please review the University's main COVID-19 Response webpage and look for emails from the University on these topics.

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.

Title IX and Mandatory Reporting Statement:

Portland State is committed to providing an environment free of all forms of prohibited discrimination and sexual harassment (sexual assault, domestic and dating violence, gender or sex-based harassment and stalking). If you have experienced any form of gender or sex-based discrimination or sexual harassment, know that help and support are available. PSU has staff members trained to support survivors in navigating campus life, accessing health and counseling services, providing academic and on-housing accommodations, helping with legal protective orders, and more. Information about PSU's support services on campus, including confidential services and reporting options, can be found on PSU's Sexual Misconduct Response website or you may call a Confidential Advocate at 503-894-7982 or by scheduling on-line: psuwrc.youcanbook.me. You may also report any incident of discrimination or discriminatory harassment, including sexual harassment, to the Title IX Coordinator, Office of Equity and Compliance, or the Office of the Dean of Student Life. Please be aware that all PSU faculty members and instructors are required to report information of an incident that may constitute prohibited discrimination, including sexual harassment and sexual violence. This means that if you tell me about a situation of sexual harassment or sexual violence that may have violated university policy or student code of conduct, I have to share the information with the University's Title IX Coordinator or the Office of the Dean of Student Life. Please complete the required student module Understanding Sexual Misconduct and Resources in your D2L, which provides information about PSU policy and resources.

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.

General student information:

Please learn about and use the many campus resources available to you via PSU's I Am A Student website: <https://www.pdx.edu/student>. These resources are made possible by your tuition and fees.

Students with documented disabilities who may need accommodations, who have any emergency information the instructor should be aware of, or who need special arrangements in the event of an evacuation, should make an appointment with the instructor as early as possible, and no later than the first week of the term. Class materials will be made available in an accessible format upon request.

All students should review the PSU policies on classroom conduct and academic honesty at, <https://pdx.smartcatalogiq.com/en/2016-2017/Bulletin/Student-Policies-and-Guidelines/Student-Conduct>

All Students

As a PSU student, you have numerous resources at your disposal. Please take advantage of them while you are here. A small sample is listed below:

Resources:

Don't forget to check out the ESM department and School of Environment webpages:

<http://www.pdx.edu/esm/>

<http://www.pdx.edu/environment/>

Advising & Career Services: <https://www.pdx.edu/careers/> and

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

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: The PSU Disability Resource Center is available to help students with academic accommodations. If you are a student who has need for test-taking, note-taking or other assistance, please visit the DRC and notify the instructor at the beginning of the term.

If you are a student with a documented disability and are registered with the Disability Resource Center, please contact me the first week of classes so that we can arrange the 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/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>