

ESM 315: Environmental Sampling and Contaminant Analysis

Spring 2023

Instructor: Scott Kiel (he/his)

Lab meets Mon/Wed 10:15 am-1:15 pm in SRTC-261

Contact: scotkiel@pdx.edu

Graduate TA: Monica Zapata Villegas (she/her)

Contact: mzapata2@pdx.edu

Availability: *Office hours will take place after class on M/W 1:15PM-2:15PM or by appointment.*

Course Description

This course is designed to provide experience with environmental sampling techniques and the quantitative analysis of chemical contaminants in water, soil and air. In addition, we will use these activities to explore the chemical and physical principles underlying the fate and transformation of contaminants in the environment.

Course Outcomes/Learning Objectives

- Understanding how to describe and reproduce basic environmental sampling techniques for the analysis of contaminants in air, water and soil
- Conducting quantitative analyses for environmental contaminants
- Explaining the basic principles underlying common analytical techniques
- Discussing how properties of environmental contaminants (chemical, physical, biogeochemical) affect sampling, detection, and other factors related to the context of this course.

Course Prerequisites

A grade of C or better in ESM 230 *and* 231 and a firm grasp of chemistry principles are required for this course.

Required Materials

- *Physical Lab Notebook* (composition notebook recommended, no tear-out or perforated pages)
- *Scientific or graphing calculator* (physical calculator with log, inverse log, exponential notation, etc.)
- *Lab-appropriate attire:* includes close-toed shoes and clothing that covers legs and arms
- *Text:* we will be utilizing a variety of source materials, excerpts of which will be posted to Canvas

YOUR SUCCESS

We do not give you grades; you earn the grades. Be sure you can commit to this course (4 credit hours = 6-12 hours *outside* of lab most weeks depending on the student). You are expected to attend every lab session this term *and* arrive fully prepared (prelab quiz completed, experiment procedure summarized in lab notebook, dressed appropriately) or you will be asked to leave. It will be important for you to take charge of your learning and make every attempt to be an active learner because chemistry and lab skills do not *just come* to the vast majority; most struggle with the expectations in lab and must work at it.

Coursework and Grading

School-Life Conflict: Many students face obstacles to their education as a result of work or family obligations or unforeseen personal difficulties. If you are experiencing challenges throughout the term that are impacting your ability to succeed in this course, or in your undergraduate career more broadly, please reach out to the instructor or TA immediately so that we can work together to form a plan for your academic success. If you miss more than two lab sessions this term, it is unlikely you will pass the course.

Tentative Schedule (see Canvas for current schedule)

Topic	Week	Supplemental Reading	Experiment	Pre-Lab Quiz + Notebook Check (Due Before Class)	Writing-to-Learn Assignments	Discussion Post Activity
Statistics & Sampling	1	ECA-CH1- Measurements ECA-CH2-Sampling	<i>group work</i>	-	-	<i>D1</i>
Water Quality	2	ECA-CH12-Water Analysis	EXP1A-WQ	PQ1A NB1A	-	<i>D2</i>
	3	ECA-CH7-Chemical Methods	EXP1B-Complex	PQ1B NB1B	eNotebook data check	<i>D3</i>
	4	ECA-CH14-QAQC	EXP1B-Continued	PS1C eNB1	TR1 <i>draft</i>	<i>D4</i>
Soil Quality	5	ECA-CH13-Soil Analysis	EXP2-SQ	PQ2 NB2	TR1 <i>peer review</i>	<i>D5</i>
Spectroscopy	6	ECA-CH6-Sample Prep	Data Analysis + TBA	PS2 eNB2	TR2 <i>draft</i>	<i>D6</i>
	7	ECA-CH13-Spectroscopy	EXP3-Metals	PS3 NB3	TR2 <i>peer review</i>	<i>D7</i>
Group Project	8	ECA-CH15-Pollutants	<i>Moss tissue Digestion, Cd and GF-AAS</i>	NB4a	Project preproposal	<i>D8</i>
	9	-	<i>Moss Prep</i>	NB4b	-	<i>D9</i>
	10	-	<i>CEC and Pb Analysis</i>	eNB4	TR1-2 <i>final drafts</i>	
Finals Week		TR3 and Moss Report due Friday June 15 th				

Flexibility statement: The instructor reserves the right to modify any aspect of the course including content, schedule, point allocations, and substitute assignments in response to institutional, weather, or class situations.

Note on Late Assignments: Late assignments will not be accepted beyond 24 hours after the due date unless you have a documented illness or emergency - email Prof to discuss arrangements.

Group Work in Lab, Individual Work at Home: Data are collected in the class group, but lab write ups and all other assignments must be done individually unless explicitly noted. Data only shared by Prof/TA.

Coursework Descriptions (see Canvas for more details)

Discussions Post:

Each week we will have a discussion post activity assigned that asks you to go deeper with the course material. Some of these discussions have an associated activity or action item with them.

Lab Experiments:

Starting in Week 2 you are required to attend every lab session prepared to complete the day's tasks. This includes passing the prelab quiz or postlab survey, summarizing the procedure in your notebook, participation in collecting data, completion of Google Data Sheet (points vary depending on # of days experiment encompasses).

Writing Assignments:

There are a variety of writing assignments that you will complete individually: three technical report drafts and accompanying peer reviews, project preproposal, and a science communication on the group project samples.

Group Project:

In Weeks 8-10 you will be working on a guided-inquiry group project. Each scheduled lab session still includes completing a postlab survey (PS = 5 pts), summarizing the procedure in your notebook (NB = 5 pts), participation in collecting and analyzing data. Additional graded components of the project are completion of organized Google Data Sheet (20 pts).

Summary of Graded Coursework and Assessment

Discussion Posts	5 @ 20 pts each	100 pts. (20%)
In-Lab Notebook Checks	6 @ 5 pts each	30 pts. (6%)
Pre-Lab Quizzes & Post-Lab Surveys	5 @ 5 pts each	25 pts. (5%)
Electronic Notebooks	5 @ 20 pts each	100 pts. (20%)
Writing Assignments	4 @ 60 pts each	240 pts. (49%)
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		495 pts

Course Grading Criteria:

A 94 – 100	B+ 87 – 89	C+ 77 – 79	D+ 68 – 69
A- 90 – 93	B 83 – 86	C 73 – 76	D 65 – 67
	B- 80 – 82	C- 70 – 72	D- 60 – 64

University Policies and Resources: a productive learning environment relies on our adherence to PSU Codes of Conduct and our crafted Community Agreements.

Academic Integrity: Academic integrity is a vital part of the educational experience at PSU. PSU defines plagiarism as including “word for word copying, using borrowed words or phrases from original text into new patterns without attribution, or paraphrasing another writer’s ideas”. If you have questions about

whether or not you should give credit to a source in your work, you may clarify it with me. In general, though, I recommend always citing the sources you have consulted, as well as those you borrow from directly. If you are having difficulty with an assignment, please contact me.

Campus Resources for Students:

- **The Basic Needs Hub:** provides students with one place to stop for all concerns related to providing for basic needs support. Our mission is to connect PSU students to resources in the moment of need so students can focus on academics, career goals, and interpersonal relationships. Additional information can be found at: <https://www.pdx.edu/dean-student-life/basic-needs-hub>
- **My Student Support Program:** PSU students taking 1+ credits are now able to access free, confidential mental health and wellbeing support 24/7 via the My Student Support Program (MySSP) @ PSU app, telephone, or website. To learn more about My SSP, please go to: <https://www.pdx.edu/health-counseling/my-ssp>
- **The Writing Center:** The Writing Center at PSU can provide help at any stage of the writing process (from idea generation to revising). You can make an appointment at <https://www.pdx.edu/writing-center/>.
- **Cultural Resource Centers:** provides student leadership, employment, and volunteer opportunities; student resources such as computer labs, event, lounge and study spaces; and extensive programming. You can find more info at: <https://www.pdx.edu/cultural-resource-centers/>.
- **Food Assistance:** Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Committee for Improving Student Food Security. You can find more info at: <https://www.pdx.edu/student-access-center/>.
- **The Center for Student Health and Counseling:** Also known as SHAC. Students may experience stressors that can impact both their academic experience and their personal well-being. PSU offers many resources, some of which are listed here: <https://www.pdx.edu/health-counseling/>.
- **The PSU Landing:** The PSU Landing at FUMC is a collaborative community resource providing transitional, temporary, safe-haven housing for PSU students navigating severe housing insecurity and homelessness. The Landing offers assistance to students by allowing them the time and support they need to seek permanent and affordable housing solutions, including guaranteed space and resources 7 nights/week with meals, for up to a complete academic term. Reach out to the PSU C.A.R.E. Team if you are in need of transitional housing assistance (askdos@pdx.edu, 503-725-4422).

Access and Inclusion for Students with Disabilities: PSU values diversity and inclusion; My goal is to create a learning environment that is accessible, equitable, inclusive, and welcoming. I am committed to fostering mutual respect and full participation for all students. If any aspects of the instruction or course design result in barriers to your inclusion or learning, please notify me. Additionally, the Disability Resource Center (DRC) provides reasonable accommodations for students who encounter barriers in the learning environment. The DRC works with students who have physical, learning, cognitive, mental health, sensory, chronic illness, and other disabilities.

- If you have, or think you may have, a disability that may affect your work in this class and feel you need accommodations, contact the Disability Resource Center to schedule an appointment and initiate a conversation about your reasonable accommodations. If you already have accommodations, please contact me to make sure that I have received your DRC Faculty Notification Email so we can discuss your accommodations.
- The DRC is located in 116 Smith Memorial Student Union, Suite 116. You can also contact the DRC at 503-725-4150 or, drc@pdx.edu. Visit the DRC online at <https://www.pdx.edu/disability-resource-center>.

Title IX Reporting: Portland State is committed to fostering a safe, productive learning environment. Title IX and PSU policies prohibit discrimination, including discrimination on the basis of sex/gender and sexual harassment, which includes sexual assault, domestic and dating violence, and stalking. We expect a culture of mutual respect in our department and class. You may report any incident of discrimination or discriminatory harassment, including sexual harassment, to either the [Title IX Coordinator, Office of Equity and Compliance](#), or the [Office of the Dean of Student Life](#). Complete the required student module [Understanding Sexual Misconduct and Resources](#) in Canvas if you have not already done so, which provides information about PSU policy and resources.

- Please be aware that as an instructor, I have the responsibility to report any instances of sexual harassment, sexual and relationship violence and/ or other forms of prohibited discrimination to PSU's [Title IX Coordinator](#), the [Office of Equity and Compliance](#) or the [Dean of Student Life office](#) and cannot keep information confidential. However, the information will be kept private and only those with a need to know will be provided with what you disclose. If you would rather share information about sexual harassment or sexual and relationship violence to a confidential employee who does not have this reporting responsibility, you can contact a [confidential advocate](#) at 503.894.7982 or by scheduling [online](#). You may also contact other confidential employees found on the [sexual misconduct resource webpage](#).
- You may also report sexual and relationship violence to law enforcement on campus with [Campus Public Safety Office \(CPSO\)](#). Or you may file an [anonymous report with Campus Public Safety Office](#) or a [Bias Incident report](#) with the [Bias Review Team \(BRT\)](#). PSU does not typically investigate the reports that are made through these two avenues. These reports help PSU understand what students and employees are experiencing on and around campus and provide support where needed.

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 "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 SHAC to discuss your symptoms and situation](#) (503.725.2800). They will advise you on testing, quarantine, and when you can return to campus.
- If you test positive for COVID-19, [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.