Oceanography 161
Introduction to Environmental Monitoring and Technology (5 Credits)

**Instructional Team:**
Professor: Dr. Sasha Seroy  
Teaching Assistant: TBD  
Email: Canvas Inbox  
Email: TDB  
Office hours: TBD and by appointment  
Office Hours: TBD and by appointment

**Meeting Times:**
Lectures: M Tu Th 10:30am – 11:20am  
Lab sections: W 10:30am – 12:20pm, 12:30pm – 2:20pm, 2:30pm – 4:20pm

**Course Overview:**
Introduces a range of environmental monitoring technologies in the context of their scientific application and case studies spanning ocean, atmosphere, and land examples. Includes hands-on experience with sensors and working with data from various technologies and monitoring techniques. Integrates knowledge across environmental science, technology, and engineering.

**Prerequisites:**
There are no prerequisites for this course and non-science majors are welcome.

**Course Format:**
This class will be conducted in-person. Students are expected to participate in class to fully benefit from course activities and meet the course’s learning objectives. Students should only register for this class if they are able to attend in-person. To protect their fellow students, faculty, and staff, students who feel ill or exhibit possible COVID symptoms should not come to class. When absent, it is the responsibility of the student to inform the instructor in advance (or as close to the class period as possible in the case of an unexpected absence), and to request appropriate make-up work as per policies established in the syllabus. What make-up work is possible or how assignment or course grading might be modified to accommodate missed work is the prerogative of the instructor. For chronic absences, the instructor may negotiate an incomplete grade after the 8th week, or recommend the student contact their academic adviser to consider a hardship withdrawal (known as a Registrar Drop). For temporary periods of absence this course is designed with flexibility in mind with drop policies for various assignment categories outlined below.

Occasionally throughout the course we will use Zoom to meet virtually. This includes when we have non-local guest scientists/engineers visit during select Thursday Lecture periods. This will be communicated in advance. Check the course Canvas site for announcements.

**Course Learning Goals:**
By the end of the course students should be able to:
- Understand how environmental changes occur over time and space and how environmental monitoring techniques and technologies are used to observe these changes
- Identify different types of instruments/technologies and understand the basic principles behind how they function
- Evaluate the benefits and limitations of different instruments/technologies and apply knowledge to analyze environmental case studies
- Visualize and make inferences from data reported from a wide range of different instruments/technology types
- Understand the types of monitoring and instruments used in modern environmental science and how to connect with professional scientists and engineers that use/operate them

**Communication:**
All course materials and resources will be posted on the Canvas course site. We will communicate with you using Canvas. Make sure you update your Canvas settings so that you receive updates and announcements and check your account often.

If you have questions, please follow these steps:
- First, carefully reread this syllabus and any relevant assignment instructions to see if the answer to your question lies there.
- If you can't find an answer to your question after rereading the syllabus and any relevant instructions, post your question in the Canvas Discussion Board.

If you have a question or issue of a personal nature, please don't hesitate to contact the instructional team by Canvas Inbox. We will respond to your message within 24 hours during the week and 48 during the weekend.

**Evaluation:**
*Each assignment category below has a lenient drop policy thus late assignments will not be accepted.*

**Participation (10%):** Lectures will occur in person (unless otherwise stated) and will include live Poll Everywhere questions that students will be prompted to answer. Submitting answers to these questions will make up 10% of your grade. Please register for Poll Everywhere. Details are below. Lectures will be recorded and slides will be posted to the Canvas site after class. If you view lectures after class you will be unable to answer Poll Everywhere questions to receive participation credit. When calculating the final participation grade, the lowest three participation grades will be dropped to provide students with flexibility.

**Topic quizzes (15%):** There will be one topic quiz per week assigned on Canvas. These will review content from the week’s module and are intended to be completed individually. Quizzes are untimed but only one attempt is allowed. Quizzes are due Friday at 5:00pm of each week. Correct answers to quiz questions will be displayed between Monday - Wednesday after the Friday the quiz is due. The lowest two quiz grades will be dropped to provide students with flexibility.

**Lab assignments (30%):** Labs for this course occur on Wednesdays. During these times you will work on the lab activities in small groups but each student will submit a completed individual lab handout due by Thursday at 5pm each week. You may hand them in in class or upload to Canvas by the deadline. Feedback will be returned in the format you submit the
assignment (on paper or digitally). The lowest two lab grades will be dropped to provide students with flexibility.

**Question submissions (10%)**: In many weeks we will host a guest scientist/engineer who will speak to us about their work which will be relevant to the topic of the week. Guests will visit class during our Thursday meeting time. For guests who cannot visit in person, we will meet during a synchronous Zoom meeting using the course Zoom link. Our class will host an interview with them to understand their work better. Students will be asked to submit two interview questions via Canvas in weeks we have a guest. In weeks we do not host a guest scientist/engineer, we will have review sessions to address student questions on the weekly module. In those weeks, students will be asked to submit two questions regarding things they are still confused about/curious about to cover in Thursday’s class. Questions will be due Wednesdays at 5pm. The lowest two question submission grades will be dropped to provide students with flexibility.

**Final Project (35%)**: There will be no final exam for this class. We will have a final project which will consist of the creation of an infographic to describe a technology of your choice and how it has been used to observe an environmental change or process. The final lab period will be devoted to student presentations of infographics. During this time, infographics will be peer reviewed using a detailed peer review rubric. Each student will be responsible for submitting peer reviews of infographics for two fellow students. Students will have the opportunity to integrate peer feedback prior to submission of the final product. Instructor will consider peer reviews in evaluating the final project grade. Grades for the final project will consist of your grade for your created infographic (30%) and your successful submission of two peer evaluations (5%).

**Extra Credit**: Several extra credit assignments will be offered during the quarter. Descriptions and details for the assignments will be posted on the Canvas course website. Each student can only earn 5 points (total) of extra credit. Completing 5 points of extra credit will raise your grade by one percentage point.

**Re-grades**: If you feel that an assignment or exam has been graded unfairly or that a mistake has been made, you may submit a re-grade request within one week of being handed back the assignment or exam. Requests must be submitted in writing and must be handed in at lecture. Requests should be stapled to the original assignment. E-mails and conversations cannot substitute for a written request.

**Course Schedule and Topics**:
The weekly modules for the course are organized such that each week covers a different type of environmental monitoring technique/technology. Understanding how these different techniques apply to different temporal and spatial scales is critical to understanding how they address different scientific needs and are able to observe different types of changes occurring in the environment. The sequence over the quarter is meant to be a “zooming out” of space and time covering technologies as they observe the earth over larger and larger space and time scales.
Weekly lectures will cover both the scientific need for the technologies/techniques of the week and the basic principles and engineering behind how that technology functions. Weekly labs will give students the opportunity to apply this knowledge via hands-on experience with various sensors and instruments, visiting labs, and/or working with real data collected from that platform. Thursday lectures will either be a guest interview of a scientist or engineer who works with that technology or a review/discussion session for the week’s topic.

Below is a tentative course schedule which may be subject to change as the course progresses.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Weekly Assignments Due</th>
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<tbody>
<tr>
<td>1 (Jan 3-7)</td>
<td>Introduction to environmental monitoring</td>
<td>QS1 (W), LA1 (Th), TQ1 (F)</td>
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<tr>
<td>2 (Jan 10-14)</td>
<td>Ship-based observations</td>
<td>QS2 (W), LA2 (Th), TQ2 (F)</td>
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<td>3 (Jan 17-21)</td>
<td>Sensing with sound</td>
<td>QS3(W), LA3 (Th), TQ3 (F)</td>
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<td>4 (Jan 24-28)</td>
<td>Imaging</td>
<td>QS4 (W), LA4 (Th), TQ4 (F)</td>
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<td>5 (Jan 31-Feb 4)</td>
<td>Robots and autonomous vehicles</td>
<td>QS5 (W), LA5 (Th), TQ5 (F)</td>
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<td>6 (Feb 7-11)</td>
<td>Sensor networks and observatories</td>
<td>QS6 (W), LA6 (Th), TQ6 (F)</td>
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<td>7 (Feb 14-18)</td>
<td>Chemical instrumentation and proxies</td>
<td>QS7 (W), LA7 (Th), TQ7 (F)</td>
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<td>8 (Feb 21 - 25)</td>
<td>Remote sensing and satellites</td>
<td>QS8 (W), LA8 (Th), TQ8 (F)</td>
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<td>9 (Feb 28 - Mar 4)</td>
<td>Combining multiple platforms</td>
<td>QS9 (W), LA9 (Th), TQ9 (F)</td>
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<td>10 (Mar 7 - 11)</td>
<td>Community science observing</td>
<td>Final Project (W), TQ10 (F)</td>
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Assignment Key: QS = Question submission, LA = Lab Assignment, TQ = Topic Quiz

Technology:
This course will require a computer to access course resources and assignments on Canvas. You will need either a laptop or a phone during lecture time to answer Poll Everywhere questions. Lab assignments will often require a laptop to access Microsoft Excel, Google Sheets or other spreadsheet software for data entry and graphing, and/or access online data portals from various environmental observing platforms. Therefore, students are strongly recommended to bring their own laptop to class, although students are certainly free to work with one another. For students without access to a personal laptop: it is possible to check out UW laptops for an entire quarter (see the Student Services office for details).

Poll Everywhere: Please register in Poll Everywhere BEFORE attending the first day of class. For information on how to respond to in-class polls, view the UW IT help page: https://itconnect.uw.edu/learn/tools/polleverywhere/set-up-account/responding-to-polls/.
Misuse of the classroom response tool Poll Everywhere will be considered academic dishonesty and will be handled according to our course policies. This includes you entering answers to questions for a peer, for any reason, allowing another student to enter answers with your identifying data, or submitting responses to questions when you are not in lecture in person. You will find instructions on how to set up and register for Poll Everywhere by viewing this UW IT help page: https://itconnect.uw.edu/learn/tools/polleverywhere/set-up-account/.

Zoom: Class sessions that occur on Zoom will be recorded. The recording will capture the presenter’s audio, video, and computer screen. Student audio and video will be recorded if they share their computer audio and video during the recorded session. The recordings will only be accessible to students enrolled in the course to review materials. These recordings will not be shared with or accessible to the public, and will be deleted after the course ends. These recordings will be available for class participants during the quarter to support your learning.

The University and Zoom have FERPA compliant agreements in place to protect the security and privacy of UW Zoom accounts. Students who do not wish to give consent to being recorded should:

- Choose a Zoom profile name that does not include any personal identifying information like their name or UW Net ID and do not upload a profile picture.
- Not share their computer audio or video during their Zoom sessions.

By enrolling in this class, all students agree to not upload the recordings to other platforms.

Access and Accommodations:
All students deserve access to the full range of learning experiences, and the University of Washington is committed to creating inclusive and accessible learning environments consistent with federal and state laws. If you feel like your performance in class is being impacted by your experiences outside of class, please talk to the instructors.

Full participation in this course requires the following types of engagement:

| Computer Literacy | The ability to open and navigate web browsers and operate basic computer software; the ability to access and navigate UW Canvas and other websites; the ability to view materials online and complete quizzes and written assignments using UW Canvas and other basic computer programs; typing text or pasting copied text into a text box; creating, saving, selecting, and uploading documents; opening, reading, and sending messages using Canvas Inbox. |
| Scheduled Lectures | The ability to attend in-person lectures at listed times; the ability to work in pairs or small groups to complete short assignments that involve calculations and present solutions to the class. |
Scheduled Labs

The ability to attend weekly in-person lab sections of 1 hour and 50 min; the ability to work in pairs or small groups to complete assignments that involve calculations and qualitative explanations.

Disabilities: If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to us at your earliest convenience so we can discuss your needs in this course. If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (e.g., mental health, learning, vision, hearing, physical impacts), you are welcome to contact DRS at 206-543-8924 or via email or their website. DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS.

Religious Accommodations: Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW’s policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy. Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form.

Academic Integrity:
The University of Washington Student Conduct Code (WAC 478-121) defines prohibited academic and behavioral conduct and describes how the University holds students accountable. We expect that you will know and follow university policies regarding all forms of academic and other misconduct.

Acts of academic misconduct include:

- Cheating:
  - unauthorized assistance in person and/or online for assignments, quizzes, tests, or exams
  - using another student’s work without permission and instructor authorization
  - allowing anyone to take a course, assignment, or exam for you without instructor authorization
- Falsification: intentional use of falsified data, information, or records
- Plagiarism: representing the work of others as your own without giving appropriate credit to the original author(s)
- Unauthorized collaboration: working with other students in the course on assignments, quizzes, or exams without permission
- Engaging in behavior prohibited by an instructor
  - sharing and posting assignment, lab, quiz or exam questions and answers
- Multiple submissions of the same work in different courses without instructor permission
- Deliberately damaging or destroying student work to gain advantage
- Unauthorized recording, and/or subsequent dissemination of instructional content
If these definitions are not clear to you, please contact the instructional team so that we can review them with you. It is important that you fully understand what is and is not permissible in this course.

Any suspected cases of academic misconduct will be handled according to university regulations, which include:

1. Submission of the case material (description of the incident and supporting documents such as an exam, paper, and any communications about the incident) to the College of the Environment Dean’s Office.
2. Suspension of the grade for the quiz, exam, homework, paper or other assignment in question.
3. An X grade for the class in the case of the academic misconduct procedure continuing past the end of the quarter.
4. A reduction, down to a zero, for the quiz, exam, homework, paper or other assignment in question should the academic misconduct hearing officer find you responsible.

For more information, see the College of the Environment’s Academic Misconduct Policy and the Community Standards and Student Conduct website.

**Diversity, Equity, and Inclusion:**
The University of Washington supports an inclusive learning environment where diverse perspectives are recognized, respected, and seen as a source of strength. In this course, we will strive to create welcoming spaces where everyone feels included and engaged regardless of their social and cultural backgrounds.

**Student Athletes:**
The Student Athlete Travel Notification form (supplied by the Department of Intercollegiate Athletics) indicating which classes will be missed must be turned in to instructors at the start of the quarter. We will discuss how you can fulfill the requirements.