Physics 290: Foundations of Physics Laboratory

I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be.

–William Thomson, Lord Kelvin, "Lecture on "Electrical Units of Measurement" (3 May 1883), published in Popular Lectures Vol. 1, p. 73

Instructor: Eric Corwin <ecorwin@uoregon.eduLinks to an external site.>

Eric's Office Hours: Probably Tuesday, 3-4pm, Wil 374 or by appointment.

GTF Contact Information and Office hours: Same as for Physics 252

Lectures: Tuesdays 3-3:50pm, Wil 110

Lab Sections: Thursdays 12-1:50pm, 2-3:50pm, 5-6:50pm, or Fridays 8-9:50am, Wil 17

Special Note Regarding Online Instruction:

This is an unprecedented and awful time. I think that it is a moral imperative for us all to help take care of one another. I want you to know that, beyond my role as an instructor and evaluator, I'm here to support you in your learning and your education. Physics 290 is a challenging course and I know that all of you are taking it because you are committed to learning and care about physics/science. I intend to teach and evaluate you in that spirit.

Overview

The fundamental conceit of this course, and of Physics in general, is that the natural world is fundamentally knowable. But that doesn't mean that it is easy or straightforward to do so. In this course we will start you on your path to becoming a scientist. In this course we will strive to address questions that we don't know how to answer. This course is taught as a companion to the Foundation in Physics I sequence (Phys 251-253), and covers Newton's theory of motion and its applications.
While this course is designed to support the material presented in Physics 251, this laboratory course is a separate class with separate goals.

Topics and Aims

1. Learn how and why we make measurements to learn about the natural world.
2. Investigation by inquiry. Devise experiments to answer fundamental questions.
3. Understand the role of error, noise, and randomness in limiting our knowledge of the world.
4. Think critically and quantitatively about the world around us.

Lecture Format

Lectures will provide an opportunity to learn about and discuss the issues that will be faced in the lab as well as provide the necessary mathematical and technical background to engage in the laboratory inquiry. Lectures will begin with an ungraded "thought question" intended to kick off the topic under consideration as well as provide for participation credit.

Lab Attendance

Students with a serious and well-documented reason for missing an assignment or exam should contact me. If you contact me in advance of the missed work then it will be much more likely that we can work out a favorable agreement.

How to Do Well in the Course

Plan ahead and start early! This applies to everything in the course - homework, reading assignments, and general studying. It will be crucial to keep up with the course and not fall behind; later topics build on earlier ones. Homework assignments, especially, will require considerable time spent thinking – the majority of your learning will come from this.

Make use of resources! If you have questions about lectures, assignments, readings, or other matters, come to office hours with questions! Also, we encourage communication by email or canvas (but won't promise to answer outside of normal work hours).

Sleep! Many studies show that sleeping helps memory and understanding.
Student Conduct and Academic Integrity:

Mutual respect in class is paramount. Academic Misconduct, as defined in the Student Conduct Code [https://studentlife.uoregon.edu/conductLinks to an external site.], including cheating, fabrication, facilitating academic dishonesty, and plagiarism, devalues the reputation of our institution, its faculty, its students, and the degrees we offer. Moreover, academic misconduct is particularly unfair for the students who do their work with integrity and honor. Violations of the student conduct code result in the incident being included on your student conduct record and can result in a failing grade on any course work related to the violation or a failing grade in the course. Every effort will be made in this class to deter dishonesty through classroom procedures. Suspected academic dishonesty will be reported.

Campus Resources to Support Learning

Tutoring and Academic Engagement Center
<https://engage.uoregon.edu/services/Links to an external site.> Drop-in math and writing support in addition to tutoring, study skills support, and Class Encore. Located in the 4th Floor Knight Library (541) 346-3226, engage@uoregon.edu.

Counseling Center Call anytime to speak with a therapist who can provide support and connect you with resources. Located on the 2nd Floor of the Health Center (541)346-3227.

Accessible Education Center The University of Oregon is working to create inclusive learning environments. The instructor believes strongly in creating inclusive learning environments. If there are aspects of the instruction or design of this course that result in barriers to your participation, please notify us as soon as possible. You are also encouraged to contact the Accessible Education Center. If you are not a student with a documented disability, but you would like for us to know about class issues that will impact your ability to learn, we encourage you to come visit during office hours so that we can strategize how you can get the most out of this course. Located on the 1st Floor of Oregon Hall (541) 346-1155, uoaec@uoregon.edu.

Center for Multicultural Academic Excellence (CMAE) Their mission is to promote student retention and persistence for historically underrepresented and underserved populations. We develop and implement programs and services that support retention, academic excellence, and success at the UO and beyond. We reaffirm our commitment to all students, including undocumented and tuition equity students. Located on the 1st Floor of Oregon Hall (541) 346-3479, cmae@uoregon.edu.
The UO Access Shuttle An on-campus ride service provided at no cost to students with conditions that limit mobility. More information and a sign-up form can be found on the parking & transportation department website: https://parking.uoregon.edu/content/access-shuttle

Additional Covid Specific Information

Academic Disruption

In the event of a campus emergency that disrupts academic activities, course requirements, deadlines, and grading percentages are subject to change. Information about changes in this course will be communicated as soon as possible by email, and on Canvas. If we are not able to meet face-to-face, students should immediately log onto Canvas and read any announcements and/or access alternative assignments. Students are also expected to continue coursework as outlined in this syllabus or other instructions on Canvas.

In the event that the instructor of this course has to quarantine, this course may be taught online during that time.

COVID Containment Plan for Classes

As the University of Oregon returns to in-person instruction, the key to keeping our community healthy and safe involves prevention, containment, and support. Here is information critical to how the UO is responding to COVID-19.

- **Prevention:** To prevent or reduce the spread of COVID-19 in classrooms and on campus, all students and employees must:
  - Comply with [vaccination policy](https://parking.uoregon.edu/content/access-shuttle)Links to an external site.
  - Wear face coverings[Links to an external site.](https://parking.uoregon.edu/content/access-shuttle) in all indoor spaces on UO campus
  - Complete weekly [testing](https://parking.uoregon.edu/content/access-shuttle)Links to an external site. if not fully vaccinated or exempted
  - Wash hands[Links to an external site.](https://parking.uoregon.edu/content/access-shuttle) frequently and practice social distancing when possible
  - Complete daily [self-checks](https://parking.uoregon.edu/content/access-shuttle)Links to an external site.
  - Stay home/do not come to campus if feeling [symptomatic](https://parking.uoregon.edu/content/access-shuttle)Links to an external site.
  - Complete the UO [COVID-19 case and contact reporting form](https://parking.uoregon.edu/content/access-shuttle) (Links to an external site.) if you test positive or have been in close contact with a confirmed or presumptive case.
**Containment:** If a student in class tests positive for COVID-19, all relevant classes will be notified via an email by the Corona Corps Care Team with instructions for students and staff based on their vaccination status. Specifically:

- **Vaccinated and Asymptomatic students:** Quarantine not required, but daily self-monitoring before coming on campus is advised; sign up for testing through MAP 3-5 days after exposure if advised you are a contact.
- **Unvaccinated or partially vaccinated students:** 14-day quarantine advised – do not come to class – and sign up for testing 3-5 days after notification through MAPLinks to an external site., if asymptomatic, or through University Health Services (541-346-2770) or your primary care provider, if symptomatic.
- **Symptomatic students:** stay home (do not come to class/campus), complete the online case and contact form (Links to an external site.), and contact University Health Services (541-346-2770) or your primary care provider to arrange for immediate COVID-19 testing.

Students identified as a close contacts of a positive case will be contacted by the Corona Corps Care Team (541-346-2292).

**Support:** The following resources are available to you as a student.

- University Health ServicesLinks to an external site. or call (541) 346-2770
- University Counseling CenterLinks to an external site. or call (541) 346-3277 or (541) 346-3227 (after hrs.)
- MAP Covid-19 TestingLinks to an external site.
- Corona CorpsLinks to an external site. or call (541) 346-2292
- Academic AdvisingLinks to an external site. or call (541) 346-3211
- Dean of StudentsLinks to an external site. or call (541)-346-3216

**Good Classroom Citizenship**

- Wear your mask and make sure it fits you well
- Stay home if you’re sick
- Get to know your neighbors in class, and let them know if you test positive
- Get tested regularly
- Watch for signs and symptoms with the daily symptom self-check
- Wash your hands frequently or use hand sanitizer

Complete the UO COVID-19 case and contact reporting form (Links to an external site.) if you test positive or are a close contact of someone who tests positive.