

# Foundation of Physics I

## PHYS 252 - Winter 2019 - CRN25684

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<b>Teaching Assistants</b>	Francesco Arceri <a href="mailto:farceri@uoregon.edu">farceri@uoregon.edu</a>	Office Hours: Wed 4:00-5:00 PM, Will. 373 Help Center: Thu 3:00-4:00 PM
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<b>Lecture</b>	MWF 10:00 - 10:50 in Willamette 100	
<b>Tutorials</b>	Tutorial sections are held on Tuesday in Willamette 112	
<b>Midterms</b>	Midterms will be held <i>in the evenings</i> of Jan. 30 and Feb. 27 in Pacific 123	
<b>Final Exam</b>	The final exam will be at 10:15 AM on Tuesday, March 19 in Willamette 100	
<b>Labs</b>	PHYS 290 is recommended, but not required for this course.	
<b>Website</b>	All communication will be made through the course website on Canvas <a href="https://canvas.uoregon.edu/courses/124854">https://canvas.uoregon.edu/courses/124854</a>	
<b>Textbook</b>	<i>Physics for Scientists and Engineers w/ Modern Physics, 4th Ed.</i> , by Randall Knight A copy is on reserve in the Science Library.	
<b>Mastering Physics</b>	All students will need <i>Modified Mastering Physics</i> access. This came with your textbook if you bought it through the UO bookstore, or can be purchased separately. A 2-week trial is available if you are uncertain about your attendance in this course. Sign in at <a href="http://www.pearsonmylabandmastering.com">www.pearsonmylabandmastering.com</a> . Our course ID is 'mcmorran00869'.	
<b>Co-Req</b>	MATH 252 or equivalent	

## Overview

Winter quarter will continue our study of kinematics, applying what we learned in Fall to rotations, fluids, and extending these ideas into oscillations and waves. We will finish the quarter exploring optics, both as wave and ray behavior.

## Course Philosophy

Decades of research on teaching strategies show that it is almost pointless to teach physics to students. Instead, students must actively engage in *learning* physics. This may seem like a semantic difference, but there is a real and demonstrable benefit to students being actively engaged and taking responsibility for their own learning. This course is designed to encourage you to learn, and one of the most important pieces of that is using class time to grapple with some of the more confusing aspects of the material. This means we will not have time in class to go over some of the more straightforward concepts, and to get the most out of this course you will need to prepare for each day by *reading the book* and engaging with the topics before we get to them in class. There will be short out-of-class activities (mostly videos and conceptual reading quizzes) each week along with small group tutorial sections to encourage you to engage the material in a meaningful way.

## Expected Workload

The University of Oregon policy ([link](#)) defines 1 credit hour as *approximately* 30 real hours of student work, both in class and out of class. Thus, a 4-credit course such as this should engage students for about 120 hours over the course of the term, though this may vary from student to student. Physics is a difficult subject that requires your steady attention to learn. To do well in this course, you will have to practice solving problems on your own, even beyond just the assigned exercises.

## Schedule

The daily course schedule is provided as a separate document to facilitate keeping it up to date. The schedule and all assignments will be posted on Canvas.

## Grading

Course grades will be based on the following categories. Please see below for more details on course expectations and how assignments will be graded.

- [HW, WHW] - Homework assignments (weekly online and written problems) - 20%
- Tutorial attendance and participation - 10%
- Class participation, reading quizzes, pre-lecture videos, etc. - 10%
- [MT] - two midterm exams - 15% each
- [F] - one final exam - 30%

Historically, scores above 90% have earned an A, scores above 80% have earned a B, scores above 70% have earned a C, while scores below ~60% have failed. Each year is slightly different, however, and the exact ranges for this course will be determined after the final exam. The overall course evaluation will possibly be graded on a curve to account for variations in the difficulty of exams, although we will not penalize the class if everyone is doing very well. Grade reports will be provided after each midterm to indicate your achievement at that point.

## Written Homework

The key goal of this course is for you to become proficient at solving physics problems, and homework is your primary means to practice this skill. Written homework will be assigned from the Problems at the end of each chapter as well as other exercises, and will be due Tuesdays at 6PM. To receive full credit you must *show your work*. Written homework problems will generally try to synthesize several concepts together, and your approach and thinking about the problem is more important than the final answer. We can not properly assess your reasoning without seeing your work.

Written homework should be turned in to the PHYS 252 box in the basement of Willamette Hall. Late homework will be accepted with a 25% penalty until noon the following day, when homework solutions will be posted to Canvas. Turning in homework up to one week late is possible, but a 50% reduction of the assignment value will be applied. If your answers are clearly copied from the solutions, no credit will be given.

Turning in late homework is better than not doing the homework at all, and practicing on the homework problems will clearly help you on the exams, but staying on top of the assignments and getting your work done on time is a key to achieving a good grade in this course.

## Online Homework

There will be weekly online homework assignments due through *MasteringPhysics*. These assignments will typically be due Tuesday evening at 11PM, and generally will be shorter problems than the written homework assignments. Late online homework assignments will not be accepted, so please make sure you are properly registered with *MasteringPhysics* before the end of the first week.

For people who want additional practice, or are interested in making up some points missed on the online homework, you can complete additional *Adaptive Followup* questions. These questions will allow you to recover up to ~10% of the assignment value, although this only earns you back points you missed. In no case will you receive 'extra credit' by doing additional problems.

You need an account at [www.pearsonmylabandmastering.com](http://www.pearsonmylabandmastering.com) and then you need to enroll in course ID 'mcmorran00869'.

## Homework Discussion

You are encouraged to find help in doing your homework, including from other students, your TAs, the physics department drop-in help center, and the instructor during office hours. Discussing homework with other students is a very good way to discover conceptual difficulties and can be a powerful tool for improving your understanding of the subject. To facilitate students who wish to work together, we will try to schedule times in the physics drop-in center (Science Library) when your TAs will be present to help people with homework issues. The physics reading room in the atrium of Willamette hall is also available for students wishing to work together.

Please note that while discussing homework problems with other students is encouraged, copying the work of others and claiming it as your own is *academic misconduct* and will be treated as such. This includes copying solutions to problems found online. Since most of your course performance is determined by exam scores, and these exams will look a

lot like your written homework problems, there is very little benefit and considerable risk to not fully engaging with the homework material. Homework is your chance to practice and to self-assess whether you are understanding the material in this course. Skipping this work will almost certainly impact your final grade.

For students looking for more intensive help, or looking for more one-on-one time, there is a list of tutors available for hire in the physics office. These are typically current UO physics graduate students or advanced undergraduates, and the list is made available by the department strictly as a helpful service (to both parties). All arrangements must be made directly with the tutors.

## **Tutorials**

The tutorial sessions are held on Tuesday in Willamette 112. Tutorials are designed to give students the opportunity to discuss and assess their understanding of course topics in a more interactive, group setting with direct feedback from the teaching staff. On some weeks, we may also introduce new material in the tutorials. On other weeks, we may work on particularly complicated problems. Other times, the tutorials will be mostly about addressing conceptual difficulties. Students will work in groups of 3-4 people on the task of the week. These sessions have been shown to be a particularly effective way for students to improve their understanding of physics, and should be viewed as an integral part of the course instruction.

The tutorials will be graded for attendance and reasonable participation only. Your answers will not be graded for correctness. It is your responsibility to make sure that your attendance is properly recorded before you leave. If you are really struggling with a particular topic, you should try to use your tutorial time working with the TAs to improve your understanding. Attendance at the tutorials is mandatory, although 100% attendance is not. In each quarter there are typically 8 mandatory tutorials, and attendance at 7 of these will result in full credit. Tutorial sessions during midterm weeks will be used as a review session, and attendance at these sessions is not required.

## **Lecture Participation**

In general, vibrant class participation enhances all students' learning experiences – we will use a “clicker” audience response system in class to mediate discussion. Clickers can be purchased used or new at the UO bookstore or online, borrowed from a friend, or borrowed from the physics collection in the front of class. If you borrow one of the physics-owned clickers, please make sure that you return it after class every day. Both i>Clicker 1 and i>Clicker 2 will work for this course (there should be many i>Clicker 1's available on the used market). Regardless of where you get it from, make sure you use the same clicker every class period, and register your clicker on the Canvas course website under 'Course Information', not the i>Clicker website. Make sure you use the same clicker each class period, bring an extra set of batteries with you, and make sure your clicker answers are logged. You are expected to enter in your own answers. *Clicking in for someone else who is not present is academic misconduct* (see below).

On some days, there will be pre-lecture videos assigned, or a pre-class reading quiz, which must be completed before class begins to receive credit. These will be posted as assignments on MasteringPhysics and announced on Canvas at least 24 hours in advance, and will contribute to the participation grade.

## Participation Grading

Extensive research in Physics education has shown that active participation including tutorials, pre-lecture videos, and in-class interaction greatly improves student understanding in physics courses. We understand, however, that 100% participation is not always possible due to illness, school activities, or other obligations.

To try to provide a flexible grading scheme that encourages participation but is not overly rigid, you will be allowed to miss several participation activities. These activities will be largely graded for completion, but getting the right answer will also count for some fraction of your participation grade.

Participation over 60% will not earn 'extra credit' in the participation grade (but it will likely improve your performance on the exams...).

## Exams

There will be two mid-term exams and a final examination. The mid-term exams will take place from 5-8PM on **January 30th** and **February 27th** in Pacific 123. You will have 2 hours for the midterm, and you can start at any time between 5 and 6 PM. The final exam is set for 10:15-12:15 Tuesday, **March 19th** and will be in 100 Willamette. These dates will not change, so please arrange your schedules to accommodate these times. In case of serious conflicts, please contact us as far in advance as possible so that we can work out a solution together. No makeup examinations will be allowed. If a higher score is achieved on the final than one of your midterms, that lowest midterm grade will be replaced by your final score. This gives you a chance to redeem yourself if you really screw up a midterm exam.

These exams are the primary tools for assessing whether you have achieved the course goals. Exam problems will be similar to written homework problems, in that you must solve quantitative problems on the physics topics addressed, and communicate your solution clearly. All exams will be closed book, although you may bring one handwritten, single-sided, notebook-sized sheet of notes if you wish. Scientific calculators will be provided on request. Cell phones, tablets, or laptops may not be used during exams (even as calculators).

## Laptop and Cellphone Policy

Apart from use during the in-class clicker questions, the use of a smartphone, tablet, or laptop computer is not allowed in class. These devices are highly disruptive to the students sitting around you [see CB Fried, *Computers & Education* **50**, 906-914 (2008)], and are rarely used for any productive, course-related purpose. If you believe you have a valid, educational reason to use a device in class (such as for translation) please discuss this with us in advance.

## Academic Integrity

All students are expected to complete assignments in a manner consistent with academic integrity. Students should properly acknowledge and document all sources of information (e.g. quotations, paraphrases, ideas) and use only the sources and resources authorized by the instructor. The University Student Conduct Code (<https://dos.uoregon.edu/conduct>) defines academic misconduct. Students are prohibited from committing or attempting to commit any act that constitutes academic

misconduct. By way of example, students should not give or receive (or attempt to give or receive) unauthorized help on assignments or examinations without express permission from the instructor. If there is any question about whether an act constitutes academic misconduct, it is the students' obligation to clarify the question with the instructor before committing or attempting to commit the act. Additional information about a common form of academic misconduct, plagiarism, is available at [researchguides.uoregon.edu/citing-plagiarism](http://researchguides.uoregon.edu/citing-plagiarism).

### **Campus resources to support your learning**

**Tutoring and Learning Center (TLC)** Drop-in math and writing support in addition to tutoring, study skills support, and Class Encore. Located in the 4<sup>th</sup> Floor Knight Library (541) 346-3226, [tlc@uoregon.edu](mailto:tlc@uoregon.edu)

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

**Accessible Education Center** The University of Oregon is working to create 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 1<sup>st</sup> Floor of Oregon Hall (541) 346-1155, [uoac@uoregon.edu](mailto:uoac@uoregon.edu)

**Center for Multicultural Academic Excellence (CMAE)** 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](mailto:cmae@uoregon.edu).

### **Inclusiveness**

Open inquiry, freedom of expression, and respect for difference are fundamental to a comprehensive and dynamic education. We are committed to upholding these ideals by encouraging the exploration, engagement, and expression of divergent perspectives and diverse identities. This is part of being a scientist.

### **Our Duty to Report**

As instructors of this course, we are Student-Directed Employees. As such, **if you disclose sensitive information to us, we will respond to you with respect and kindness. We will listen to you and will be sensitive to your needs and desires. We will not judge you. We will support you.** We will direct students who disclose sexual harassment or sexual violence to resources that can help and **will only report the information shared to the university administration when the student requests that**

**the information be reported.** As Student-Directed Employees, we can offer privacy because we are not required to report certain information to the university. However, we cannot be bound by confidentiality in the same way that a counselor or attorney is. Unless someone is in imminent risk of serious harm or is a minor, we will keep your disclosure private. Please note the differences between confidential and private. For more information on reporting obligations of employees and specific details about confidentiality of information, visit [titleix.uoregon.edu](http://titleix.uoregon.edu)

### **Discrimination and Harassment Resources**

Additional help and resources for any student who has experienced sexual assault, relationship violence, sex or gender-based bullying, stalking, and/or sexual harassment are available at [safe.uoregon.edu](http://safe.uoregon.edu) or by calling the UO's 24-hour hotline 541-346-7244 [SAFE] or the non-confidential Title IX Coordinator at 541-346-8136.

Students experiencing any other form of prohibited discrimination or harassment can find information at [respect.uoregon.edu](http://respect.uoregon.edu) or [aaeo.uoregon.edu](http://aaeo.uoregon.edu) or contact the non-confidential AAEO office at 541-346-3123 or the Dean of Students Office at 541-346-3216.