# PHYS 253 – Foundations of Physics I (CRN 37449)

## SYLLABUS

**Updated March 29, 2014**

### INSTRUCTOR
Dr. Benjamin McMorran, Asst. Professor, UO Department of Physics  
Email: [mcmorran@uoregon.edu](mailto:mcmorran@uoregon.edu)  
Office (Willamette 174): Mon 10am-11am, Tue 11:00am-12:00pm & by appointment

### TEACHING ASSISTANTS
- Chris Jackson (graduate TA)  
  Email: [cjackso9@uoregon.edu](mailto:cjackso9@uoregon.edu)  
  Office (Wil. 262): Mon 3-4 pm, Fri 3-4 pm  
  Drop-In Help Center: Mon 10am-11am  

- Dave Grych (graduate TA)  
  Email: [dgrych@uoregon.edu](mailto:dgrych@uoregon.edu)  
  Office (Wil L140): Mon 12-1pm, 2-3 pm  
  Drop-In Help Center: Fri 8am-9am

- Saba Moslehi (graduate TA)  
  Email: [sabam@uoregon.edu](mailto:sabam@uoregon.edu)  
  Office (Wil. 72): Tue 4-5pm, Wed 10-11am  
  Drop-In Help Center: Mon 2pm-3pm

- Maira Amezcua (graduate TA)  
  Email: [mamezcua@uoregon.edu](mailto:mamezcua@uoregon.edu)  
  Office (Wil 261): Tue 4-5 pm, Thu 2-3 pm  
  Drop-In Help Center: Thu 10am-11am

### LECTURE
MWF 9:00-9:50 am, 100 Willamette Hall  
*Attendance is not strictly required, but note that there is a “clicker-based” participation grade – see the Grading section below.*

### TUTORIAL
All tutorials are on Tuesdays in 112 Willamette  
*Attendance is not strictly required, but note that there is a participation grade roughly equal to 1% of your final grade for each tutorial – see the Grading section below.*

### DROP-IN HELP CENTER
The Physics Drop-In Help Center in 147 Willamette is staffed by physics TAs during normal business hours. Specifically, PHYS 253 TAs will also be available in The Drop-In center at the times specified above, but other TAs will be available pretty much any time during normal working hours. Please let Prof. McMorran know if a scheduled TA is not there.

### BLACKBOARD
We will be using Blackboard in this course to distribute course materials. URL: [https://blackboard.uoregon.edu/](https://blackboard.uoregon.edu/)

### LABS
PHYS 290 recommended, but not required for this course (but it is required for major)

### TEXTBOOK
*Physics for Scientists & Engineers with Modern Physics, 4th Ed.*, by Douglas Giancoli  
Two copies are reserved at the Science Library (call # SB MCMORRAN)

### SMARTPHYSICS
We will be using an online physics learning tool called SmartPhysics. You are expected to complete the SmartPhysics assignments before 8 AM on the day of most lectures (MWF). The first deadline for SmartPhysics Homework is also at 8 AM before the lecture. These problems are designed to be straightforward to answer if you read the associated textbook sections. Each SmartPhysics unit will be made available one week in advance.

To register for the new class without losing your already paid for account:
1) Login to your existing Smartphysics account.  
2) You will see "Inactive Enrollments" showing last term's regular access portal. Above this on the right, click "Join a Course".  
3) Enter the code provided in the syllabus, "UO253S14" (without quotes).  
4) It should automatically supply your UO duck ID (the prefix to your uoregon.edu email account). Confirm it is correct to proceed.  
5) If you have been enrolled in SmartPhysics all year, you shouldn’t need to purchase
additional access to SmartPhysics. Use Smartphysics as you are used to!

If you are new to SmartPhysics, you will have to create a SmartPhysics account. Contact me for help.

**i>Clicker**

We will use a “clicker” audience response system in class. Clickers can be purchased at the UO bookstore or online, or borrowed from a friend. Both i>Clicker 1 and i>Clicker 2 will work for this course (there should be many i>Clicker 1’s available on the use market). Register your clicker on the Blackboard course website, not the i>Clicker website [NOTE: If you are using the same clicker you used last term, you do not need to register it again (I think)]. Make sure you use the same clicker each class period, and bring an extra set of batteries with you.

**PRE/CO-REQ**

PHYS 252, MATH 253 (Calculus) or equivalent

**EMAIL**

You must use your uoregon.edu email address when corresponding with the instructor and TAs by email. Please mention PHYS 253 in the subject line.

**TOPICS AND AIMS**

This term we will discuss electromagnetism. The following topics (Ch. 21-31) will be covered:

- Electrostatics – electric charge, electric field, Coulomb’s law, Gauss’ law
- Electric potential
- DC and AC circuits – resistors, capacitors, inductors, Ohm’s law
- Magnetism – magnetic fields
- Electromagnetic Induction - Faraday's law, transformers
- Electromagnetic waves

Physics is intrinsically a "simple" subject in the sense that natural phenomena are explained by reducing them down to a few underlying principles. There are two important goals for this course:

- Learn the fundamental concepts underlying electricity, magnetism, and its applications.
- Learn how to arrive at quantitative answers.

**Solving physics problems (assigned homework at the very least) is the only way to master these skills.**

**GRADING**

- 5% - in-class participation (discussion and clicker questions – no penalty for 3 skips)
- 10% - tutorial participation (~1% point for each tutorial – no penalty for 1 skip)
- 15% - SmartPhysics unit (all) (due by 8:00am most MWF – lowest 3 scores dropped)
- 20% - tutorial homework (due Tuesdays by 6:00 PM – lowest score dropped)
- 15% - first midterm exam (Wednesday, April 23, 6:00 PM, Willamette 100)
- 15% - second midterm exam (Wednesday, May 21, 6:00 PM, Willamette 100)
- 20% - final exam (Thursday, June 12, 10:15 AM – 12:15 PM, Willamette 100)

**Final Grade:** A=90-100%; B=80-89%; C=70-79%; D=60-69%; F<52%

If necessary, I may apply a curve to achieve a higher average final grade. However, you are guaranteed at least the grade listed here based on your course average. Pass/fail grading option: A passing grade requires at least the equivalent of a C- grade.

**HOMEWORK**

Turning in complete homework on time is crucial to getting a good grade in the class. Working (and struggling) on textbook problems yourself provides the only opportunity to gain insight into the concepts you're learning and prepare for the exams. Homework is due each Wednesday before 6:00 PM, in the appropriately labeled box in the basement of Willamette. Late homework turned in Thursday gets a 25% penalty, and after Thursday gets a 50% penalty. In calculating final grades, the lowest homework score of the term will be deleted, assuming the homework has been turned in and valid attempts have been made at all the problems. Thus, even if homework is late (even after Thursday)
you are encouraged to turn it in so that it can be checked for completion and the low score can be removed during final grading.

Feel free to discuss the questions with others, but of course, the work you submit should be your own. It is not recommended to look for solutions to problems online, but if you do you MUST cite your source (e.g., URL) and include your own additional comments and details. If you get the solution from somewhere else, you must include additional information (further analysis, filled-in details, comments, etc.) showing that you thoroughly understand the solution. Simply copying solutions and/or not citing sources will be treated as a violation of the Academic Code of Conduct. Again, you are discouraged from seeking solutions to problems. Solutions to all the problem sets will be posted – study these.

Homework will be a set of problems from your book, and occasionally another exercises. You must circle your answers. Only a few homework problems may be graded for correctness (we will try to mark which ones) – the rest will be graded for completion. This is because (a) there a large number of students in the class and very few graders, and (b) we want to eliminate the attraction of looking up solutions online. Students are expected to compare their answers to the posted solutions.

Grades will be posted to Blackboard on or by the Monday after homework is turned in. Please check your Blackboard account regularly and report any discrepancies or possible errors as soon as you notice them.

**Note:** There will be a homework assignment due during Dead Week.

### MIDTERM EXAMS
There will be two evening midterms, one at **6:00 PM on Wednesday, April 23** and one at **6:00 PM on Wednesday, May 21**. Both will take place in **Willamette 100**. There will be **no makeup exams**. If there is a serious (e.g., involving illness) and well-documented (e.g. with a doctor’s note) reason for missing the midterms, the final exam score will count extra, in place of the missed tests.

### FINAL EXAM
The final exam will take place at **10:15 AM - 12:15 PM on Thursday, June 12**. You must take the exam at this time. (No exceptions.) Bring a calculator to the final.

### ACADEMIC MISCONDUCT
Students have the responsibility to behave honorably in an academic environment. The University Student Conduct Code (available at conduct.uoregon.edu) defines academic misconduct. Academic dishonesty, 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. All incidences of suspected academic misconduct will be reported to the Office of Student Conduct and Community Standards. The procedures for handling academic misconduct cases are outlined in Oregon Administrative Rule OAR517-021-0215.

You must work by yourself on exams. On homework and in tutorials, you are allowed (and encouraged) to work with other students, the physics drop-in help center, your TA and your instructor. However, you should **not** just directly copy from them. Doing so is not only academically dishonest, but will hurt your ability to do the problems on the exams.

### LAPTOPS AND PHONES IN CLASS (NONE)
The use of laptop computers and phones in class is discouraged. Why? Several studies show that students using laptops in class spend a great deal of time on non-class-related activities (texting, FB, playing games, etc.) and that these distractions negatively impact
both learning and grades. This alone isn’t a reason to ban laptops – you’re responsible for your own performance in class. In addition, however, studies have shown that laptop use distracts and impacts the learning of other students nearby. (E.g. Fried, C. B. Computers & Education 50, 906-914 (2008).) Plus, students have complained about the environment created by their classmates’ laptop use. Taking notes by hand, by the way, is more effective in cementing concepts in your mind – you can always take a quick photo of your notes if you want a digital copy.

**How to Do Well in the Course**

- Attend class.
- Complete the SmartPhysics pre-lectures and checkpoints before coming to class.
- Read the suggested textbook sections before coming to class. Work through examples.
- Participate in clicker questions and discussions in class (both talking and listening)
- Do all the homework, turn it in on time, and study the solutions.
- Work on understanding all the concepts and example questions discussed in the lectures and the homework. “Understanding” does not mean “it sounds like it makes sense to me,” but more deeply, “I could explain this concept to one of my classmates.”
- Come to office hours, with questions (especially ones you think you should know) – we’re nice!
- A suggestion: **Sleep!** Numerous studies show that sleeping helps both memory and understanding.
- And another: Avoid low blood sugar during exams (and all class periods) by eating a snack or meal beforehand.

**SPS**

The U of O has an active chapter of the Society of Physics Students (SPS). This is a good thing to be a part of if you wish to hear more about physics research and how to get involved. See [http://physics.uoregon.edu/~sps/](http://physics.uoregon.edu/~sps/) for more information.

**Students with Special Needs**

If there are aspects of the instruction or design of this course that result in barriers to your inclusion, please notify me as soon as possible. You are also welcome to contact Disability Services in 164 Oregon Hall, 346-1155.