

# Physics 216: General Physics II (for Physics Majors and Honors Students)

## Spring 2015

### General Information

Course Time and Place: Tues./Thurs. 12:30-1:50PM in PB106  
Instructor: Dr./Prof. Schwarz  
Instructor's Office: PB215  
Instructor's Phone: 607-342-0876  
Instructor's E-mail: phy216.spring2015@yahoo.com  
Course Webpage: [www.jmschwarztheorygroup.org/phy216/](http://www.jmschwarztheorygroup.org/phy216/)  
Office Hours: Tuesdays/Thursdays 2:30PM-3:30PM or by appointment

### Course Objectives

What is typically one of the first things you do once you get out of bed in the morning? You stumble over to your computer and stare at your computer screen checking for new messages in your inbox, the latest news, and possibly even the weather. Your computer, as well as many other devices you own, is powered by *electricity*, which is the first topic we are going to cover in this course. Electricity is a consequence of the fact that all ordinary matter contains electric charges.

Meanwhile, the next thing on your morning to-do list is to turn on a light, which, again, is powered by electricity, and allows you to wander over to the refrigerator in a darkened room with drawn shades. *Light* is another phenomenon that will be covered in this course.

Finally, as you open the refrigerator door you notice a new tear in your picture of Einstein hanging, by, yes, a magnet. Darn. You will have to get a new picture. *Magnetism* is the third topic that will be covered in this course.

Ok. So, electricity, light, and magnetism are very much part of your everyday experience, just as gravity is. One may think they are indeed three separate phenomena. To the contrary, it took physicists—physicists trying to uncover general principles of how matter and energy behave—to realize that all three phenomena can be unified under one concept dubbed *electromagnetism*. This unification sheds light (no pun intended) on how to potentially unify the other forces—gravitational, weak, and strong—into a theory of everything. In addition, electromagnetism has many practical consequences as discussed above, making it both elegant *and* useful.

By the end of this course, you will

- (1) understand the laws of electromagnetism and
- (2) understand how to apply these laws to physical situations.

More precisely, will you be able to design your own electric motor, understand how the so-called “God particle” was recently discovered, comprehend how your brain works, and grasp the implications of the principle of invariant light speed. Such understanding will be both at the qualitative and quantitative level. Moreover, because this course is for physics majors and honors students, I will touch on a wider range of topics (how the brain works) at a slightly more

quantitative level than PHY212.

## Textbooks

There are two **required** textbooks for the course. The first is cleverly titled: *Physics for Scientists and Engineers: A Strategic Approach, 3rd Edition, Vol. 4* by R. D. Knight. Make sure you purchase the third edition published in 2012. Most of the lectures will invoke material from this textbook at some point or another. The second textbook is the Student Workbook accompanying Vol. 4, which will be the basis for the workshops detailed below.

## Lectures

Lectures will consist of discussing the relevant concepts, demonstrations that further illuminate the concepts, and working through sample problems. *Attending these lectures should greatly enhance your chances of success in this course so, by all means, attend.*

## Workshops

There will be two one-hour workshops each week where you will tackle a variety of problems and tutorials. Attendance at these workshops is required. You may miss up to two workshops over the course of the semester with no penalty to your workshop participation grade (see below). While the activities conducted during this workshop will help your understanding of the material, they will not be graded. Finally, please bring both textbooks to each workshop.

## Homework

Homework assignments will be due on essentially a weekly basis. The problems will mainly consist of the end-of-the-chapter problems from the required textbook. The assignments will be posted on the course website and the due date will be posted on the assignment. The due date will be one of the workshop dates since the homework will be turned in at the beginning of the respective workshop. The homework will be checked for completeness and selected parts will be graded in detail by the TA in a conventional manner. At the end of the semester your lowest two homework scores will be dropped. In all cases, late homework will not be accepted, particularly since solutions will be posted on the course website after right the homework is handed in.

## Exams

There will be three eighty-minute in-class exams during the semester. Each exam will focus on the material discussed three or four weeks prior to the week of the exam. However, given the structure of physics, earlier material may also be involved. The exams will be closed book, but you may bring one double-sided 8.5 inch by 11 inch sheet of paper with your own handwritten notes. Your lowest exam score will be dropped and there are *no makeup exams*. Also, students who do not take the final exam, or miss two or more in-class exams, will not pass this course. Such is life.

## Assessment

Exams 1-3: 40 percent  
 Final exam: 25 percent  
 Homework: 25 percent  
 Workshop participation: 10 percent

### A Note About Working with Friends and Academic Integrity

Students are encouraged to discuss the course content with each other. However, when it comes time to complete your weekly homework assignment, **the final work you turn in must be your own**. You should never copy anybody else's work, or even paraphrase it. Copying is against school policy and can ultimately result in expulsion. If you have not read over SU's academic integrity policy, it can be found online at [http://supolicies.syr.edu/ethics/acad\\_integrity.htm](http://supolicies.syr.edu/ethics/acad_integrity.htm). Enough said about that!

### Academic Accommodations for Students with Disabilities

Students who are in need of disability-related academic accommodations must register with the Office of Disability Services (ODS), 804 University Avenue, Room 309, 315-443-4498. Students with authorized disability-related accommodations should provide a current Accommodation Authorization Letter from ODS to me (Dr. Schwarz) and we will review those accommodations together. Accommodations, such as exam administration, *are not provided retroactively*; therefore, planning for accommodations as early as possible is necessary. Please go to <http://disabilityservices.syr.edu> for further information.

### New Religious Observance Policy

SU's religious observances policy, found at [http://supolicies.syr.edu/emp\\_ben/religious\\_observance.htm](http://supolicies.syr.edu/emp_ben/religious_observance.htm), recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes. For fall and spring semesters, an online notification process is available through MySlice/Student Services/Enrollment/My Religious Observances from the first day of class until the end of the second week of class.

Once I am notified of each student's religious observances for the semester, I will discuss with each of you individually revised due dates for assignments, etc.

### Consultation

Physics teaching assistants will be available for consultation in the Physics Clinic located in PB104S. For Clinic hours, please see the Physics Department web page. Of course, you can also consult me and Sean Sweeney ([sesweene@syr.edu](mailto:sesweene@syr.edu)), the TA assigned for this course.