

PHYS 2212K – 8:00 AM – 9:55 PM MWF

Text: OpenStax University Physics, Volumes 2 and 3

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Office Hours: 1 PM-3 PM T-W & by appt.

Our schedule for the semester is to cover chapters 5-16 in the second volume and the first six chapters of the third volume by covering approximately one chapter per week. This is a large amount of material, and you should spend at least 12 hours per week working problems, reading the book **and the online notes**, and reviewing your own notes. The expected learning outcomes for this course are: familiarity with and ability to solve problems involving Coulomb's law, Gauss' law, electric fields and potentials, Ohm's law, both AC and DC circuits including resistors, capacitors, and inductors, magnetic fields, induction, geometric optics, wave optics, and relativity. The grade reported to the academic early alert system will consist solely of your score on the first test.

Homework

You are free to work in groups on your homework assignments, but you should be careful not to use the group as a crutch. When you're taking a quiz or test, there won't be anyone there to help, and you'll have to rely on your own understanding. Homework will be assigned and graded via ExpertTA. You will need to purchase a key online at www.theexpertta.com or at the bookstore. Your name and student email has been used to register you in this class at the web site. You should go to the web site and try to log on as soon as possible. There is a free trial period, and after that the cost is about \$35.

You should print a copy of your homework while you are solving it. If you have waited until the last minute before the homework is due and your internet connection goes down, you can still work the problems on your printed copy and bring them to class that morning for a grade (this should happen once or less in a semester!). Otherwise, you will get no credit for the assignment.

Working problems is extremely important in any physics class. Although the online homework would make it possible, I'm not going to assign a huge volume of problems. You are advised to work as many problems as you can – you'll soon see that there can be a big difference between following along in class and being able to do problems on your own (during a test). **There will be no extensions or makeups for homework.**

Once the deadline has passed for a homework assignment, video solutions will be posted online (you will be given or emailed the location later). You should watch the solution for any problem you did not solve or were not sure about. I can solve the problems in class, but doing it this way will allow you to avoid sitting through solutions you already know, and to replay difficult ones. We are going to devote some of the time gained by doing this to the use of the Arduino microcontroller. The environment will be installed on the lab computers and we'll have some labs where we gather data with it.

Attendance

When you arrive, please turn off your cell phones, computers and all other electronics, and put newspapers, etc. away. **I do not want to see your phone during class – no texting, calling, etc.** You should bring an ordinary scientific calculator to class and **especially** to the tests. I will clear the memory of all programmable calculators before each test. If your calculator is programmable and **not** a TI of some kind, **sometime before the first test**, make sure you have brought it to me so I'll know how to clear it and you'll be able to use it during your test.

The lecture and lab portions of the course are blended together in an effort to have a smoother integration between these parts. This means that we will probably not have a solid schedule of what lab or activity

we'll be doing every day this semester. I can give you estimates of when things will happen, but there's going to be uncertainty attached to those estimates. For that reason, I would advise you to attend each class. One lab exercise will be dropped, but beyond that, they will start adversely affecting your grade. You should expect to be in class the entire time every day; if we happen to finish early, that's a bonus. When we are doing a lab, anyone leaving early (even with permission from his/her fellow group members) should expect a **disproportionately large** penalty on his/her portion of that lab.

Labs will typically occur at the beginning of a given class period. Because arriving late is both inconsiderate and unfair to the rest of your group members, you will lose 1 point (out of a possible grade of 10) if you are less than 10 minutes late. From 10-19 minutes late, you will lose two points, three from 20-29, etc.

Honor Code

The Student Conduct Policy (found at <https://students.georgiasouthern.edu/conduct/files/2018-2019-Code-of-Student-Conduct-FINAL-1.pdf>) will be strictly upheld. Any violations will become part of the student's permanent educational record and will receive the harshest punishment allowed, including but not limited to a grade of **F** for the course. Plagiarism, which is defined as using someone else's words or ideas (i.e., paraphrasing) **without proper attribution**, is an honor code violation. **DO NOT** try this! It is assumed that anything in your lab report that is not credited was written by you and/or your group members whose names appear on the front page. This applies to information from the Internet as well as all other sources. Submitting a report for which you have already received a grade (e.g., in a previous semester, etc.) is also not allowed.

Tests and Grading

As of this writing, there will be three tests, the lowest of which will be dropped (others worth 20% each), a final exam worth 25%, in-class exercises and lab reports for 25%, and an undetermined number of homework assignments for the remaining 10%. The tests will be approximately evenly spaced throughout the semester. If you **must** miss a test, you must **contact me as soon as possible** to schedule a makeup exam. While you aren't required to attend class, your excuse must cover the time from the original exam date until you return to class ready to take the makeup. Keep in mind that the make-up test will almost certainly be harder than the original test; I tend to put the most straightforward questions possible on the main test, and the ones on make-up tests are therefore usually more complicated.

For the reports associated with lab exercises, you can get an idea of what is expected from the information available on my web site under "Lab Report Guidelines". You should rotate the report-writing and make sure that each group member has a copy of all data as well as a copy of the finished report. **Error analysis is a large part of the report.**

This syllabus is subject to modifications (which will be announced in class) during the semester.

Mon	Tues	Wed	Thurs	Fri	Sat
14 FDOC CSEM, Coulomb's Law	15	16 Electric Field	17	18 Gauss' Law	19
21 MLK Day	22	23 Coulomb Lab	24	25 HW 1 due 2212 Electric Potential	26
28 Capacitance, Voltage	29	30 2212 HW 2 due Gauss Lab	31	1 Ohm's Law, Power	2
4 HW 3 due Voltage lab	5	6 Problem solving lab	7	8 Circuits pt 1 (KVL, KCL)	9
11 DC PhET Lab	12	13 Test 1	14	15 Circuits pt 2 (RC)	16
18 Magnetic fields, Lorentz Force	19	20 RC Lab	21	22 HW 5 due Biot-Savart, Ampere	23
25 Start induction	26	27 Correlations	28	1 HW 6 due RL, RLC circuits	2
4 AC circuits	5	6 Arduino Lab I	7	8 EM Waves, Maxwell's Eqns HW 7	9
11 Refl, Refr, Pol	12	13 Problem Solving 2	14	15 PhET AC	16

JAN

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FEB

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18	19	20 Spring Break	21	22	23
25 RLC lab	26	27 Test 2	28	29 Geometric Optics	30
1 Interference	2	3 Diffraction	4	5 Optics	6 PhET HW 9
8 Relativity 1	9	10 HW 10 Relativity 2	11	12 Relativity 3	13
15 Photoelectric & Uncertainty	16	17 Assessment test	18	19 HW 11 Photoelectric PhET	20
22 Arduino 2	23	24 No Class Student Scholarship Symposium	25	26 Problem Solving 3	27
29 ALG Survey	30	1 2212 Test 3	2	3 Arduino EKG Lab	4

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APR

MAY