

Syllabus for Physics 142: Spring 2011

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Goals of the Course

Using the scientific method, we will learn and understand the basic concepts and principles of physics. To achieve this goal, we will use laboratory exercises, discuss real-world applications, and employ some algebra. We will be covering a lot of important concepts during this semester. For this reason, you will have daily assignments and frequent quizzes.

Important Information

Instructor and Contact Information: You can reach me by emailing at phil.segre@emory.edu.

Office Hours: My office is in the back room through Pierce 207. I have an open door policy: if I am in the office and the door is open, feel free to come in. We can talk about physics and homework assignments, your student life, and anything else you would like to chat about. You can also email me to make individual appointments.

Tutor: Wesley Anderson is a Physics tutor. The day/time and location of his sessions will be announced in class.

Prerequisite: Math 111 or 110A and Physics 141 or 151.

Textbook: Serway and Vuille, College Physics, Eighth Edition.

Homework: Following the tradition of introductory science courses at Emory University, all homework assignments will be done ONLINE at the WEBASSIGN website. To get started,

- Goto <https://www.webassign.net/login.html>.
- Click on: **I HAVE A CLASS KEY**
- Enter **emory 2141 9543**
- Enter and name and info as requested.

There will be one homework assignment every week, typically due on Fridays, and consist of approximately 10 problems. The online homework problems are from the end of chapter problems in your textbook. The problems will be announced in class and will be accessible to you when you login to Webassign.net. Remember, you will be entering in your homework answers online, and will NOT turn in anything to me. The site will immediately give you feedback as to whether you answered the problem correctly or not.

Daily reading: After each class, I will assign the reading that you are REQUIRED to do BEFORE coming to class the next time. By doing the reading before coming to class, you will be better prepared to follow the material covered in class.

Tests and Exams: There will be three tests and one final exam. The tests will be on the material covered up until that point (the second test will cover the material after the first test and, similarly, the third test will be on the material after the second test). All tests will be taken on Friday afternoons (see detailed schedule below). The final exam will be cumulative. There is no such thing as a make-up exam!

Attendance: I find attendance and class participation to be vital for this course. You will find the homework to be really easy to do, if you come to class and you actively participate by asking questions. You are allowed 3 absences regardless of whether you have a valid reason for them or not. Therefore, I recommend that you save those for when you really need them (eg. you get

sick) instead of skipping class. If you are absent from class on a day when there is an Organic Chemistry or a Math test, 10 points will be taken off of your next Physics test. If you exceed the 3 absences, I will deduct 5% off of your final grade for every additional absence. ATTENDANCE IS MANDATORY FOR LAB SESSIONS.

Tardiness and Cell Phones: Being late for a class, or having your cell phone ring in the middle of one, is distracting not only for you but also for me and for your classmates. Students who are late for class for more than 5 min will generally not be allowed to attend that days lecture and will be considered absent. Students whose cell phone rings during class will be asked to leave the classroom and will be considered absent. For the same reason, I will not allow food or drink during class, with the exception of a bottle of water.

Grading: Grades are assigned on the plus-minus scale. The final grade will be determined based on the following weighting:

- (1) Homework: 15%
- (2) Exams: 15% each, 45% total.
- (3) Labs: 15%
- (4) Final: 25%

Course Content: Electricity, Magnetism, Optics and, if time permits, some Modern Physics.

Important dates: Make sure you include these important dates in your planner/calendar.

<i>DATE</i>	<i>DESCRIPTION</i>
Friday, Feb. 11, 2pm-4pm	Test #1
Monday, Feb. 14	Draft for first full lab report due in class
Monday, Feb. 28	First full lab report due in class
Friday, March 4, 2pm-4pm	Test #2
Friday, April 8, 2pm-4pm	Test #3
Wednesday, April 20	Second full lab report or final project presentation during lab
Friday, April 29, 2-5pm	Final Exam

Working with the Honor Code: The Oxford College Honor Code applies to this course as follows:

- Quizzes, tests, exams: The work presented in these assignments should be your own. No collaboration permitted. You are expected to follow the instructions given by me and abide by the Honor Code. Sharing calculators, pencils, etc., is not allowed.
- Lab report, lab project: On these assignments you can only collaborate with your lab partner.
- Homework: You are allowed to work in groups to work on your WEBASSIGN homework sets. Remember though that while you will all have the same homework problems to complete, the WEBASSIGN system will randomize for each student the numerical values of the problem variables (i.e. problem 3.27 will read $m = 3.1$ kg for one student, $m = 5.4$ kg for another and so on).

- Study groups: You are encouraged to form study groups and study concepts together and explain to each other things that you were not clear about from class or from your reading assignments.

Religious Holidays: You need to tell me immediately if any religious holidays will interfere with the course, especially the final exam and tests

Requirements for the Lab portion of this course

As noted above, the lab portion of the course constitutes 15% of your grade. For the lab portion of the course the requirements are as follows:

- (1) Bring your lab handout: You will be given the lab handout approximately a week in advance. You are expected to have read the lab handout BEFORE coming to the lab. To ensure that, you will take a pre-lab quiz before each lab section.
- (2) Answer all the questions in the lab handout: Some of these questions will require that you spend time at home analyzing the data and drawing graphs. ALWAYS bring the answers to those questions in next weeks lab for me to check. Failure to present these answers will result in a failing grade on that weeks lab.
- (3) Understand the lab: Experiments require repetition in order to ensure that your data is reproducible. Sometimes students regard this repetition as busy work. However, remember that at all times you need to be thinking about what your data means, if this is what you expected and why (or why not) and, also, what the reproducibility (or lack of) means. Essentially you are expected to be thinking about what conclusions you can draw from your data. There will be post-lab quizzes to ensure that you have understood the data and the purpose of the experiment.
- (4) A full lab report (for due date, see the table above). For one lab experiment (I will announce which one) you will have to do one lab report. I have given you more detailed handouts on what a proper scientific lab report should look like. The lab report will be corrected and graded and detailed comments will be given. If you desire, you could resubmit the lab report (after addressing all the comments) and the lab report will be re-graded, erasing in this way the first grade. You can only resubmit the lab report once.
- (5) Towards the end of the semester you will have a choice of a) either doing another full lab report (on an experiment of your choice, this time) or doing a small final project. For the final project you will have to pick a topic and, using the physics you have learned throughout the semester, you will have to explain how it works during a 15min oral presentation. As an example, a topic can be How do rockets fly? Depending on your preference (how many people decide to do the project) we will have the last lab section of the semester devoted to the presentations. The final projects will be group projects.

BOOK CHAPTER SECTIONS COVERED IN PHYS 142:
Serway and Vuille, College Physics, Eighth Edition.

TOPIC	SECTIONS
Electric Forces and Fields	Ch. 15: 1-5
Electrical Energy and Capacitance	Ch. 16: 1-4, 6, 8-10
Current and Resistance	Ch. 17: 1-3, 5, 6
Direct-Current Circuits	Ch. 18: 1-5
Magnetism	Ch. 19: 1, 3-9
Induced Voltages and Inductance	Ch. 20: 1-8
Alternating-Current Circuits	Ch. 21: 1-6, 11
Reflection and Refraction of Light	Ch. 22: 1-4, 7
Mirrors and Lenses	Ch. 23: 1-7
Wave Optics (if time allows)	Ch. 24: 1-8
Relativity (if time allows)	Ch. 26