

PHY2049 GENERAL PHYSICS II WITH CALCULUS

Summer 2018

Instructor: Douglas H. Laurence

Time: MW 4:30PM – 6:40PM

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Room: 5/211

Course Website: [PHY2049 Course Website](#)

Office: Room 7/135.

Office hours: M, T, W, R from 3:00P – 4:30P

Required Materials: All you are **required** to buy is the **Textbook:** Physics for Engineers and Scientists, 3rd ed., Hans C. Ohanian (either Volume 2 **and** 3, or the full textbook). You also need a **scientific calculator**; graphing/programmable calculators **are not allowed** during exams.

Additional Materials: There are plenty of great reviews online of physics and mathematics. For math, I think that [Paul's Online Math Notes](#) can't be beaten, so I would definitely start there. For physics, MIT's Physics II course from 1999, taught by Walter Lewin, is highly regarded. YouTube still has the old lecture videos, which can be found [here](#).

Objectives: During the semester, we will cover the following topics:

- Mathematics Review
- Electrostatics
- Electrodynamics/Circuits
- Magnetism
- Geometric Optics
- Introduction to Modern Physics

The last segment of material, Introduction to Modern Physics, depends on time. Essentially, there are two broad topics that we can break modern physics into:

- **Relativity:** Special relativity (Ch. 36) and Cosmology (last section of Ch. 41). Relativity is Einstein's study of objects that are either moving very fast (special relativity) or are very massive (general relativity).
- **Quantum Mechanics:** Quanta of light (Ch. 37); Spectral lines, Bohr theory, & quantum mechanics (Ch. 38); Atoms, molecules, & solids (Ch. 39); Nuclei (Ch. 40); and Elementary particles (first sections of Ch. 41). Quantum mechanics is the study of the really small, like particles, nuclei, and atoms.

Ideally, we would be able to cover Relativity and then Quantum Mechanics. However, as you can probably guess, this is a lot of material, so we will more-than-likely only have enough time for one of these subjects; which one we cover will be decided upon by a vote in class.

Prerequisites/Co-requisites: PHY2048 and PHY2049 are **prerequisites**, and PHY2049L, General Physics I with Calculus Lab, is a **corequisite**.

Tentative Course Outline: This syllabus is **subject to change with prior notification** from the professor. The Course Website (see the top of the syllabus) has the **most recent course information**, so check it frequently!

Week of	Monday	Wednesday	Week of	Monday	Wednesday
May 14	Math Review/ Electric Force	Electric Force/ Electric Field	July 2	Review for Exam 2	July 4
May 21	Gauss' Law	Electric Energy	July 9	Exam 2/ Modern Physics	Modern Physics
May 28	Memorial Day	Capacitors	July 16	Modern Physics	Modern Physics
June 4	Ohm's Law/ DC Circuits	DC Circuits	July 23	Modern Physics	Review for Exam 3
June 11	Review For Exam 1	Exam 1/ Magnetic Fields	July 30	Exam 3/ Final Review	Review for Final Exam
June 18	Magnetic Fields	Magnetic Forces	August 6	Final Exam	End of Class
June 25	Electromagnetic Induction	E&M Waves/ Geometric Optics			

* **Blue days are days off, red days are exam dates.**

Exam Structure: For each exam, except the final exam (which is determined by the College), you will have the **first 1 hour, 15 minutes of class for the exam**, which will be taken in our regular classroom. There will then be a 5 minute break, and the **last 50 minutes of class will be dedicated to a new lecture**. Unfortunately, due to the shortness of the summer semester, and the length of each individual class, I have to pack in as much material per class as I can. The exams are going to be a combination of multiple choice questions, which will either be conceptual in nature or of the so-called "plug-and-chug" variety (we'll discuss these types of problems a lot in class), and free response problems, which will be multi-step, involved computations that take much longer to solve than the quick multiple choice problems.

Each exam will have **10 multiple choice problems** worth 2.5 points each, for a total of 25 points. Each multiple choice problem will have **four options**, (a) through (d), or will be True/False. There are many ways you can eliminate options if you aren't sure about the answer, and we will cover some of them throughout the class. Additionally, there are **3 free response problems** worth 25 points each, for a total of 75 points. Thus each exam will be scored out of 100 points. **There will actually be FOUR free response problems per exam, of which you only have to answer THREE, so you get to choose one problem to "drop". You may NOT turn a solution in for the fourth problem for extra credit.** If you turn in an exam with free response problems 1, 3, 4 solved, I will grade those, but if you turn in an exam with all 4 solved, I will grade 1 through 3, **regardless of whether or not those were your three best answers.**

The exam content will break down in the following way:

- **Exam 1:** Chapters 22 – 28
- **Exam 2:** Chapters 29 – 31 and 33 – 34
- **Exam 3:** Modern Physics (chapters **TBD**)
- **Final Exam:** All material covered on previous exams

Exam Dates: I gave the exam dates above, but here they are in a way that's quick to reference:

Exam 1	June 13, 2018
Exam 2	July 9, 2018
Exam 3	July 30, 2018
Final Exam	August 6, 2018

Grading Rubric: My grades are assigned on a **sliding scale**, meaning that your lowest exam hurts you the least and your best exam helps you the most, though the final exam is worth the same number of points no matter what. The scale is:

Quizzes	15 points
Lowest-graded Exam	10 points
Mid-graded Exam	20 points
Highest-graded Exam	25 points
Final Exam	30 points
Total	100 points

You can use the following formula to compute your grade in the class (the grading scale follows this section):

$$\text{Points Earned} = (\%QZ * 15) + (\%LG * 10) + (\%MG * 20) + (\%HG * 25) + (\%FE * 30)$$

where QZ is your quiz grade, LG is your lowest-graded exam, MG is your mid-graded exam, HG is your highest-graded exam, and FE is your final exam; the % signs indicate to write your scores out in percentages (as decimals), instead of total number of points.

Quizzes: In place of homework, we will have weekly quizzes, which will be given **every Monday during the last 5 minutes of class**, unless otherwise stated. Quizzes, in general, will not be given during the same week as an exam. For example, Exam 1 is scheduled to be given on Wednesday, June 13; no quiz will be given that Monday, June 11. Each quiz will have **one conceptual question and one problem involving a calculation**. These quizzes are meant to make sure that you are remaining current on your studies, as the summer semester is extremely quick-paced, and it is easy to fall behind and stack up all of your studying for the days immediately before the exam. **The lowest quiz grade will be dropped** in the calculation of your final grade. Since homework will not be assigned, I will post **recommended questions** from the back of the textbook for you to study; these are not to be turned in for a grade, they are purely to aid you in your studying.

Grading Scale: The following table tells you how many points are required to earn a particular letter grade. Notice how I display the points: I always round to **first decimal point**, which means that if you score a 64.94, that equals 64.9, which is a D; if you score a 64.96, that's a 65.0, which is a C.

A	85.0 – 100.0
B	75.0 – 84.9
C	65.0 – 74.9
D	55.0 – 64.9
F	< 54.9

Course Policies:

- **Attendance:** Attendance isn't taken, but you should absolutely attend every lecture. Physics is a very difficult subject, and the lectures are going to help you learn it; not attending a lecture means forfeiting the main help you have in learning the subject.
- **Classroom Conduct:** As long as your behavior isn't disruptive or disrespectful to your classmates, I generally don't care how you spend your time during lecture. I'm fine with arriving late or leaving early (coming to a portion of the lecture is better than missing it entirely), as long as you don't disrupt class when you do so; you are free to bring your laptop to class or use your phone, but I would recommend only doing so in the pursuit of understanding the material we're covering. Essentially, you're an adult and I will allow you to make your own decisions, as long as they don't affect anyone else in class, but I strongly encourage you to participate in the class and take full advantage of the professor.
- **Religious Holidays:** If there is a scheduling conflict for a major religious holiday, it is **your responsibility to coordinate with me in advance** to get an extension or re-schedule an exam. A religious holiday **is not an acceptable excuse** to miss an assignment **without talking to me first**.
- **Excused Absences:** As defined by the Broward College Student Handbook, 2017-2018 ed., found at [this link](#), an excused absence is an "[absence] from academic activities because of observances of major religious holy days in his/her own faith, the student's serious illness, death in the immediate family*, or attendance to statutory governmental responsibilities**." The immediate family is defined as "mother, father, spouse/domestic partner, child, brother, sister, grandparents or grandchildren." A statutory governmental responsibility is defined as "such matters as jury duty, subpoena for court appearance, or unplanned military obligation." As discussed in the previous section, religious holidays need to be discussed prior to their occurrence in order to receive an excused absence. The same applies to **any foreseen absence**, such as a doctor's appoint, a *planned* military obligation, a *scheduled* court appearance for a civil matter (or a matter such as a parking ticket), etc. You are responsible for learning all material covered in your absence, even if it's excused, meaning that material cannot be removed from an upcoming exam if you have an excused absence; you still need to learn what you missed.
- **Academic Dishonesty:** Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. The Academic Dishonesty policies of the Student Handbook apply to this course; see above policy on Excused Absences to find the link to the current edition of the handbook.
- **Code of Conduct:** The College has a strict Student Code of Conduct to make the College a safe learning environment for everyone. The Student Code of Conduct of the Student Handbook apply to this course; see above policy on Excused Absences to find the link to the current edition of the handbook.