

Physics 17 · General Course Information · Fall 2009

Physics 17 is the second semester of introductory physics, and deals with the subjects of electromagnetism and electronics. It relies on the material of Physics 16 (or Physics 23), mechanics, as well as the first semester of calculus (Math 11). Those who have not had these prerequisites (or their equivalents) should see me right away.

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My “official” office hours are Monday 10 a.m.–11 a.m. and Tuesday 2–3 p.m. You should feel free to track me down at other times; I am quite often in my office or in one of my laboratories (Merrill 112 or Merrill 113).

Textbook The text for this course is *Physics for Scientists and Engineers, Vol. 2, 5th ed.* by Paul Tipler and Gene Mosca, which may be purchased at the Amherst Bookstore. (The ISBN for this volume is 0-7167-0810-8, if you wish to purchase it from an online vendor instead.) I will try to have a few copies available in the library as well. You will also need a so-called “PRS Transmitter,” available from the IT Department in Seeley Mudd.

Class Meetings The course meets M W F at noon in Merrill 2 for lectures, discussion, and problem solving, and either Thursday or Friday afternoons for lab in Merrill 208. This year I am going to try again a little experiment in which the hour meetings are *not* (for the most part) going to be traditional lectures. I will provide structure and an overview of the topics, and lots of fun demonstrations, but some of the time you will be actively answering questions that I pose to you in class. If you answer a majority of these questions correctly over the course of the semester then you will be able to devalue the weight of the final exam! (See Grading Policy, below.)

Reading Assignments Since the lecture component won’t necessarily cover every topic you’ll be responsible for, you are required to complete the assigned reading before each class meeting. **Keeping up with the readings is one of the most important things you can do in this class, even if you don’t understand everything fully on the first attempt.** Come to class or office hours with questions, or email them to me as they come to you, and I’ll be happy to help you out.

Lab Meetings Lab meetings will be held Th 1–4 p.m. and F 1–4 p.m. Attendance at and performance of all of the laboratory exercises is MANDATORY to pass the course. For more information, please see the Laboratory Information handout.

Problem Sets Each problem set will be assigned on a Wednesday and will be due on the following Wednesday at the beginning of class. No late work will be accepted without advance permission. The problems assigned are really a “minimal” set — you are strongly encouraged to try additional problems, and if you do, I would be delighted to discuss the answers with you.

Problem Help Sessions In order to help solidify your grasp of the material, there will be at least one problem help session a week. To begin, I’ll plan to hold a session on Tuesday evenings from 7–9 p.m.

Exams There will be two midterms and one final examination. These examinations will cover *all* topics from the assigned readings, whether or not they have been discussed in class — so make sure to do the readings and ask questions!

Grading Policy Your final grade breaks down as follows:

- Homework: 20%
- Labs: 20%
- Midterms (each): 15%
- Final Exam: 30%

Doing well on the in-class questions over the course of the semester can reduce your final exam weight by as much as 10%.

Miscellany This year we will also be using, to some extent, the CMS web site. If you miss a problem set or lose a handout you will be able to find a replacement there.

The system that allows you to respond to questions in class is called “PRS.” It is my hope that the technology will not get in the way of the learning experience, and

we will quickly abandon it if it proves to be too much of a hassle. I will have more details about PRS at our first class meeting.

The Honor Code reads:

Every person's education is the product of his or her intellectual effort and participation in a process of critical exchange. Amherst cannot educate those who are unwilling to submit their own work and ideas to critical assessment. Nor can it tolerate those who interfere with the participation of others in the critical process. Therefore, the College considers it a violation of the requirements of intellectual responsibility to submit work that is not one's own or otherwise to subvert the conditions under which academic work is performed by oneself or by others.

On the homework assignments it is permissible (and I encourage you!) to work in small study groups to solve the problems. In the end, however, it is important to write up (individually) and submit what *you* understand of the material. No collaboration of any kind is allowed on the examinations. Please refer to the Lab Information handout for information on intellectual responsibility as it pertains to the laboratories.

Physics 17 · Tentative Syllabus · Fall 2003

This syllabus is subject to revision. Please do the readings before attending class, and come to class with questions! [*Notation: Chapter §Section.*]

Meeting	Topic	Tipler	Notes
Sep. 8	Charges and Coulomb's Law	21 §§1–3	
Sep. 9	Electric Fields	21 §§4–7	
Sep. 11	Calculating Electric Fields	22 §1	
Sep. 14	Gauss's Law	22 §§2–3	
Sep. 16	Electric Fields Near Surfaces	22 §§4–5	
Sep. 18	Electrostatic Potential	23 §§1–2	
Sep. 21	Calculating Electric Potentials	23 §§3–4	
Sep. 23	Equipotential Surfaces	23 §§5	
Sep. 25	Energy and Capacitance	24 §§1–2	
Sep. 28	Capacitors and Batteries	24 §§3–4	
Sep. 30	Dielectrics	24 §§5–6	
Oct. 2	DC Circuits	25 §§1–4	(review)
Oct. 5	Catch-Up and Review for Exam		
Oct. 7	Catch-Up and Review for Exam		
Oct. 8	Midterm Exam I		7–10 p.m.
Oct. 9	Kirchhoff's Rules and RC Circuits	25 §§5–6	
Oct. 12	(No class)		
Oct. 14	Magnetic Fields and Forces	26 §1	
Oct. 16	Motions of Charges in Magnetic Fields	26 §2	
Oct. 19	Current Loops and the Hall Effect	26 §§3–4	
Oct. 21	Magnetic Fields of Moving Charges	27 §§1–2	
Oct. 23	Ampère's Law	27 §§3–4	
Oct. 26	Faraday's Law	28 §§1–3	
Oct. 28	Motional EMF	28 §§4–5	
Oct. 30	Inductance and Superconductors	28 §§6–9	
Nov. 2	AC Circuits	29 §§1–2	(review)
Nov. 4	<i>RLC</i> Resonant Circuits	29 §§3–6	
Nov. 6	Transformers	29 §7	
Nov. 9	Maxwell's Equations	30 §§1–2	
Nov. 11	Catch-Up and Review for Exam		
Nov. 12	Midterm Exam II		7–10 p.m.
Nov. 13	Electromagnetic Waves	30 §3	
Nov. 16	Properties of Light	31 §§1–4	

Nov. 18	Reflection and Refraction	31 §6	
Nov. 20	Polarization	31 §§7–8	
Nov. 30	Mirrors	32 §1	
Dec. 2	Lenses	32 §2	
Dec. 4	Optical Instruments	32 §4	
Dec. 7	Phase Coherence and Interference	33 §§1–3	
Dec. 9	Diffraction	33 §§4,6	
Dec. 11	Optical Resolution	33 §7	
Dec. 14	Catch-Up and Review		
	Comprehensive Final Examination		TBA