



Syllabus



Phys116b-Hutson-Fall 2010

DESCRIPTION AND OBJECTIVES

Phys 116b is the second part of a two-semester, calculus-based course in general physics. Topics to be covered include electricity and magnetism, optics, special relativity and a brief introduction to quantum mechanics. The course is appropriate for engineering and pre-professional students (pre-med, pre-physical therapy, pre-dental, pre-architecture, pre-law, etc). Physics majors may take this course, but are advised that the Phys 121a,b sequence would be more appropriate.

Prerequisites: a first semester course in physics (Phys 116a, 121a or AP credit)

Co-requisites: a physics lab (118b) and a calculus course (Math 150b or 155b)

Click the link to access the [REVISED schedule of topics and reading assignments for the semester](#) . There is still a [link to the original schedule here](#) .

For each of the topics we cover, my primary goal is for you to learn the foundational concepts. We will start with concrete observable phenomena, build conceptual models that explain these phenomena, and then add on the mathematical details. I certainly expect you to solve problems at an appropriately challenging level, but I also expect you to use your conceptual knowledge to reason about physical phenomena. Such reasoning requires a deep understanding of physics. Although the topics we will cover, particularly electricity and magnetism, often require advanced mathematics, don't be fooled - mathematical sophistication without conceptual understanding is not physics. I will emphasize both the conceptual and mathematical aspects of physics and help you build a firm foundation for your future studies.

CLASS STRUCTURE. Over the last 20 years, several groups have looked very carefully at how students learn physics. They have found that student learning improves when students are actively thinking about physics instead of passively listening to a lecture. With that in mind, you will not hear much conventional lecture from me. **Your success in this course will depend on your active participation.** To encourage your active participation, I will use two tools: in-class "clicker" questions and pre-class "warm-up" questions (see below for details). Your participation (as measured by these tools) will count 6% of your total grade. You can see how everything works together in this [schedule of a typical week](#) .

CLASS TIME AND LOCATION. Tues/Thurs 11:00am-12:15pm in Stevenson Center 4309

CONTACT INFORMATION. Professor M. Shane Hutson, Stevenson Center 6835, 343-9980 (office) or 319-0027 (cell, until 10 pm)

shane.hutson@vanderbilt.edu

OFFICE HOURS: Wednesday 3:00-4:00pm in my office
Thursday 2:00-3:50pm at the [Help Desk](#)

REQUIRED MATERIALS

TEXT. H.D. Young and R.A. Freedman, *University Physics*, 12th edition, volumes 2–3
We will cover chapters 21–39 this semester.

ONLINE HOMEWORK SYSTEM. [MasteringPhysics](#)

When you bought the text for the course, you should have also received a *MasteringPhysics* Student Access Kit. Follow its directions to register with *MasteringPhysics*. If you bought a used textbook, you can purchase online access using a credit card. There are two pieces of information you will need to enroll in the course at *MasteringPhysics*: (1) your VUNet ID (a sequence of letters from your name, e.g. *bligemj*); and (2) the Course ID, which is VUHUTSON2010. Be sure to use the correct course ID! There is no opportunity to change this after registering.

CLICKER. *TurningPoint ResponseCard*

These are the same clickers used across the Vanderbilt campus. I will ask "clicker" questions nearly every class and your responses will count as part of your final grade. See the Clickers page for more details.

GRADING POLICIES

Your grade for the course will be determined by a weighted average:

Midterm Exams (3 @ 18% each)	54%
Final Exam	26%
Homework	15%
Clickers Responses	3%
<u>Participation in Warm-Up Discussions</u>	<u>3%</u>
TOTAL 100%	

If your average exceeds 90, 80, 70, 60 then you will be guaranteed at least an A–, B–, C–, D– respectively. At my discretion, I *may* curve grades up on a single exam or overall at the end of the semester. I will never curve down from the guarantees above.

MIDTERM EXAMS. There are three exams scheduled during the semester. I have scheduled these as in-class exams on the following dates:

- ~~Thursday, September 23, covering Y&F Chapters 21–26~~
- Tuesday, September 28, covering Y&F Chapters 21–26
- Thursday, October 21, covering Y&F Chapters 27–31
- Thursday, November 18, covering Y&F Chapters 32–36

FINAL EXAM. The final examination is scheduled for Saturday, December 18 at 9:00 am. The final exam is comprehensive and covers topics from throughout the course. There will be some extra emphasis on material that comes after the third exam (i.e. from Y&F Chapters 37–39). Be aware of the final exam date when making end-of-semester travel arrangements. At present, I have no plan to offer an alternate final.

GRADING ERRORS. The course TAs and I are human, and try as we may, will probably make some errors in grading exams. We will be happy to reconsider your score, but such requests must be made in writing. Obviously, if we added up your score wrong, your written request should just show our mistake. If you feel your answer was more correct than we gave you credit for, then your request must clearly state why this is so (We assume no one will make such a request if we mark a wrong answer right).

HOMEWORK. Homework sets in *MasteringPhysics* are **due weekly on Thursdays at 11:59pm**. I may extend this deadline at my discretion, so check the due date for each assignment in *MasteringPhysics*. Details for how the homework is to be graded are given on the [Homework Details](#) page.

LATE HOMEWORK. For homework sets submitted after the deadline, your score (calculated as on the Homework page) will be multiplied by a late penalty factor. At the deadline this factor is equal to 1 (no penalty). Over the course of the next 24 hours, it decreases linearly to 0.5. After 24 hours past the deadline, it remains at 0.5. Thus homework that is more than a day late will receive a maximum of 50% partial credit.

CLICKERS.** Your participation in class will be graded via the Personal Response Systems (aka "clickers"). Details on how these will be graded can be found on the [Clicker Details](#) page.

WARM-UP DISCUSSIONS.** Your participation will also be graded by your contributions to the Warm-Up discussions. These are PRE-CLASS discussions of the assigned reading. I will start a new thread in the [Warm-Ups](#) forum at least two days prior to each class. The initial post for each thread (class) will ask an open-ended question. The reading should help you answer this question. The post will also ask you to comment on what you found particularly interesting and/or difficult about the assigned reading. I expect everyone to leave a substantial comment (not just a "ditto on bligemj's comment") before EVERY class. Your comment(s) for each thread are **due 3 HOURS BEFORE the corresponding class**. After that time, the thread will be locked. I need this time to review the comments and adjust my plans for class time that day. I will respond to some comments in class and to others via email. Prior to each exam, I will review your overall comment history to determine your score for this activity (3% of your overall grade). You are encouraged to Rate Posts in the forum that you found particularly helpful!

**If a student would like, special arrangements can be made with the instructor to do alternate work to replace the Clicker and Warm-up grades which together count 6% of the total grade. These arrangements must be made before September 15.