

College Physics II (Phys 186)

Syllabus

Taner Edis

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1 How to Find Me

The best way to reach me is **e-mail**, edis@truman.edu. Otherwise, you can try calling my office at 785-4583, or faxing me at 785-4045.

My office hours are, Tuesdays: 10:30–11:00, 13:00–15:00, 16:30–17:00; Wednesdays: 13:30–14:30; Thursdays: 10:30–11:00, 14:30–15:00, 16:30–17:00. There's a good chance I will be around my office at other times as well. To see when I am most likely to be available, check my **typical schedule** (www2.truman.edu/~edis/courses/schedule.html).

I will be using the web to post course-related notices and documents. Bookmark www2.truman.edu/~edis/courses/186/, the Phys 186 home page.

2 Course Description

Physics 186 continues the broad survey of physics started in Physics 185. While it does not rely on calculus, it does require a solid understanding of algebra and trigonometry. Both the lectures and the labs will deal with abstract problem solving. The labs emphasize using mathematics to explain the experiments performed; the lectures acquaint you with basic concepts in waves, electromagnetism, and modern physics. You will also use graphs to help you interpret data and visualize concepts.

This course involves a fair amount of homework and individual study of the textbook. Physics is notorious in that you might think you grasp the

4 REQUIRED COURSE MATERIALS

concepts, but often discover otherwise when confronted with a problem you have to solve. *Much of your learning will come about as you solve problems, not just read the text!* You will work (and be graded) both individually and as part of your lab group.

The official information goes as follows:

Maxwell's synthesis of electricity and magnetism in the mid-nineteenth century led to unexpected knowledge about the nature of light. It opened the door to a whole new world view developed by twentieth century physicists and paved the way for the technological revolution that characterizes modern life. Students will make extensive use of algebra and trigonometry in applying the fundamental laws of classical physics to real-world problems, and will explore the physicist's approach to inquiry through laboratory investigations. Prerequisite: Physics 185 with grade of C or higher.

Physics 186 is a General Honors Course, and it fulfills the Physical Science Mode of Inquiry of the Liberal Studies Program.

3 Schedule

Lectures: Tuesday and Thursday from 15:00 to 16:20 in MG 1096.

Lab: Wednesday 10:30–12:20 and 14:30–16:20 in MG 1002.

Final Exam: Thursday May 7, 11:30 to 13:20 in MG 1096.

4 Required course materials

- The textbook: *College Physics: A Strategic Approach* by Knight, Jones, & Field, **including access to *Mastering Physics*, the online tutorial and homework system that is associated with the textbook.**

- A decent calculator: One that can do trigonometric functions, exponentials, and can handle scientific notation.
- A supply of regular (not logarithmic) graph paper.

5 Online Assignments

I will be assigning about 10 homework exercises each week, which you will do online, using the *Mastering Physics* system. If you use it properly, the online material will be very helpful to you. It's vital for you to grapple with problems on your own in order to learn physics. Following the lectures and reading the textbook is what gets you going, naturally, but the only way to see if you've really grasped the ideas and not just fooled yourself into thinking you understand is to do lots of problems.

As an incentive for you to practice online, 10% of your final grade will be based on your homework assignments. Note that 10% is not a lot. I don't want you to have to worry about homework being a major influence on your overall grade, but I also want you to take it seriously and not fall behind when practicing problem solving.

Let me emphasize again: the object of the homework is to help you to practice and learn, not to test you. If you come to my office and ask, I will walk you through homework problems and even give you answers. But *try it yourself first!* Fight the computer; get frustrated. It's all part of the learning process.

If you email me, I will also often help out. But please, make sure you're not asking about something trivial, or just hunting for a few points extra on a homework assignment. Say that some quirk of the online assignment system cheats you out of 10% of the credit due you on a problem. (This will occasionally happen.) This error will affect less than 0.01% of your final grade. Less than one percent of one percent. It's not worth your time or my time to worry about such things. An extra ten minutes reading your textbook will have a much bigger effect than recovering your miniscule 10% of a problem credit.

6 Exams

You will have two midterms and a final exam. These will be closed-book, though you will be allowed to refer to the inside front and back cover of your

text. You will need your calculator. You will not be permitted to borrow anyone else's calculator or text, so be sure to bring your own calculator and text to all exams.

You will also be allowed a one-page (both sides) cheat-sheet for each exam. Preparing the cheat-sheets for the exams will serve as a useful review.

Be forewarned: my exams are *difficult*. I like to see if you can think about physics, not just plug-and-chug to solve problems very similar to what you have encountered before. I give plenty of partial credit, but to get it, you will need to write clearly, and make sure you work with symbols as much as possible rather than plugging in numbers from the outset. Typically, a quarter to a third of my students get A's from the course. But my exams are difficult.

For exam dates, see the [Course Calendar](#) on the 186 web site.

7 Extra Credit

You will also have an opportunity to earn up to 5% worth of extra credit, on top of the 100% you would shoot for normally.

An extra credit submission will consist of a brief (one page maximum) description of how some concept from physics that we have learned about applies to or connects with something related to your major. For example, if you're a biology or health-related major, you will notice plenty of biomedical examples throughout your textbook. Find something that's *not* in your physics textbook. It doesn't have to be complicated. It can be something you notice yourself—in fact, I'd prefer it if you make this connection between physics and your major yourself.

The best extra credit assignments will also include a problem-solving element: throw in some numbers and solve some equations if you really want to impress me.

You can submit two extra credit papers, worth an additional 2.5% each. The deadline for each extra credit submission is the first class meeting after each midterm.

8 Labs

You will have ten labs throughout the course. Check the [Course Calendar](#) on the 186 web site for a schedule.

Each lab is described in a pre-lab. These are available on the [186 web site](#). Read (at least skim) the appropriate pre-lab before you show up for a lab. You may also want to print it out. You only have two hours to work in the lab; don't waste time by having to read up on the lab during lab time.

This course is not for physics majors, so the object of the lab is not to introduce you to rigorous lab procedures. I will keep things informal; I will not, for example, require a special lab notebook or demand a set format for lab reports. Typically, you will write down what you are doing in the lab on loose sheets of paper. This will include observations, calculations, and graphs. This is what I will require that you turn in at the end of a lab session: a record of what you did, as you did it. Indeed, your pre-labs will provide a list of what exactly you need to turn in at the end. You do not have to collect your material and organize and prettify it for a formal report. You certainly do not need to write down a description of the experiment, the procedure, and so forth.

You will work in groups of up to three (four at most). Groups can change from lab to lab. You will turn in all your work in common—a single report for each lab group.

If you do a competent but unimaginative lab, so that you turn in all the requirements but don't show any evidence of thinking much about what you were doing, your group will receive about a 16 or 17 out of 20 points for that lab. Errors and omissions will reduce that grade. Getting closer to 20 out of 20 requires that you demonstrate to me that you gave some thought to what you were doing, beyond fulfilling requirements set out in the pre-lab. For example, if you invent some interesting procedure to do a certain measurement, make a relevant observation and speculate on what might have caused it, or show some awareness of the possible sources of error and uncertainty in your measurements, write all these down. These show some thought, and impress me.

It's very difficult to organize lab make-ups, so I do not intend to have make-ups. Do not miss any labs!

You will also have a lab exam toward the end of the semester. This will be based on activities done during lab, and each of you will work alone. If you make a habit of relying on others in your lab group to handle the equipment and make decisions, then you will not be able to complete the lab exam successfully. Make sure you actively participate in every aspect of every lab.

Check the [Course Calendar](#) on the 186 web site for when the lab exam is scheduled.

9 Grades

You should consider a grade below 60% as unsatisfactory work, an “F.” A grade of 75% is satisfactory work, “C.” 85% (“B”) means you have done all that was asked for and appear to understand it. A grade of 95% (“A”) means you have mastered the material—you did all that was asked for and you demonstrated mastery through your work. There may be minor changes in how I determine the final letter grades, but if you want to see how you are doing, you should first calculate your percentage as follows.

First, refer to this table to find out how much each of your tests and assignments are worth:

Online Assignments	10%
Labs	$10 \times 2 = 20\%$
Lab Exam	5%
Class Participation	5%
Midterms	$2 \times 20 = 40\%$
Final	20%

“Class participation” represents the small amount of flexibility I will have in adjusting your grade depending on my judgment of how you’ve done in learning physics. It will naturally be higher the more I get to know your work, and the more you ask questions and participate in the classroom. *I love questions in class*, and if you ask many, you’ll be sure to get the full 5%.

The default percentage ranges corresponding to letter grades are:

89.5%–100.0%	A
79.5%–89.4%	B
69.5%–79.4%	C
59.5%–69.4%	D
0.0%–59.4%	F

I may shift the borderline between certain letter grades by a small amount so that the line lands in the middle of a naturally occurring gap. Thus, it

is possible you may get 88% and end up with an “A,” but do not count on it. Due to FERPA regulations, I will not post any grades—I will hand back graded exams, and you can always call or e-mail me.

10 Policies & Advice

- Expect to spend 7 hours per week outside of class on this course; less if you find the course easy, more if you find it hard.
- Do not expect to read something once in your text and understand it; plan on going over much of the text more than once.
- I will not lecture directly out of the textbook, but I expect you to study it. If you are having difficulty understanding parts of the textbook which I have not addressed in class, it is your responsibility to ask about those parts.
- I encourage you to ask questions often, and I will ask you questions often. It is perfectly acceptable if you struggle with a question and end up getting an “incorrect” answer (sometimes there is no “correct” answer!), but it is not acceptable to not try.
- You need not show how you obtain the answer to a multiple choice, yes/no, or similar question with a short answer. For all other work, you must show how you arrived at your result, either by way of an explanation, or by clearly showing the steps in your calculation. If you did something correctly but I am unable to follow your reasoning as it is written, you may receive little or no credit. It is your job to make it easy for me to understand what you are doing.
- I will return graded work to you during class.
- There will be no making up of labs or exams, or late work accepted, unless you are on some legitimate school-related trip, you are sick, there is a death in the family, or something of that nature. If there is some problem which will cause you to miss class I expect you to try to notify me before you miss the class. If you are unable to notify me beforehand, please notify me as soon as possible afterwards. If you don’t have a valid reason for missing a class, please don’t ask to make up what you missed. Oversleeping is not a valid reason, nor is a

problem with your printer or computer. Problems having to do with non-prescription drugs or alcohol are not valid reasons either. If you miss a class for *any* reason, you are responsible for finding out what you missed and for getting work to me on time.

- If you are sick, please *stay home*. You will be allowed to make up whatever you missed.
- Do not ask if you can make up labs, exams, or any other work, or if you can take the final exam early, because of problems scheduling rides home. You are expected to be here during the regularly scheduled times. If you choose to be gone at those times and don't hand in the work due early, you will not be allowed to hand things in late, or to make up any work you missed.
- I care about maintaining academic integrity, and I will apply all Truman policies. See http://conduct.truman.edu/conduct_code.asp for the **Student Conduct Code**. Nonetheless, I do not expect academic dishonesty, nor will I go out of my way to look for it. I run my classes on a kind of honor system: I will often leave you alone during labs and exams, and I take your word for whether or not you missed a class or exam for a valid reason. If I do find anyone cheating or helping someone else cheat, they will automatically fail the course.
- It is a disruption when someone comes in late or leaves before class is over. Please try to be on time and stay until class is over. I will do my best to start and end class on time.
- Have your textbook, a pen or pencil, and a calculator (one which does trigonometric functions and scientific notation) with you during classes, lab, and tests, and do calculations and derivations along with me during class.
- I will do my best to accommodate all disabilities. Talk to me about what you may need.