

PHYS 213: Engineering Physics 1

Lecture: MW 12:30–1:20, CW 103
MW 1:30–2:20, CW 102
Spring 2010

Lecturer:

Prof. Brett Esry
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Office Hours:

Mondays 3:30–4:30,
Thursdays 2:30–3:30, and
By appointment

Textbook:

Physics for Scientists and Engineers, 6th edition, e-book version by Tipler and Mosca. See the WebAssign document for information on accessing the e-book.

Technology:

This course will utilize the following:

- **K-State online** to distribute all course information, including syllabus, schedule, grades, solutions, and practice material — you must be enrolled to see it.
- A web-based homework tool called WebAssign (www.webassign.net). You must purchase an access code for WebAssign. See the separate write-up on the textbook and WebAssign.
- An e-book version of the text. You will need to purchase access to this through the WebAssign site.
- An i-clicker for in-class participation. You must purchase an i-clicker and bring it to every lecture. You must also register your i-clicker at www.iclicker.com. See the separate write-up on i-clickers.

Sections:

You must be signed up for three sections: lecture, studio, and quiz. If you are not enrolled (or waitlisted) in all three sections, see me immediately.

Course philosophy and goals:

Work hard! We are cramming a few hundred years worth of knowledge gained in physics into two semesters. The course moves quickly, builds on itself, and if you don't work hard to keep up, you will find it nearly impossible to catch up.

Physics is the most fundamental way of understanding how the world works. Thus, the physics we will cover provides the basic underlying concepts of essentially all engineering. In a very real sense, engineering is “applied physics” — the result of basic physics research done long before.

This class will also provide you with plenty of opportunities to hone your problem solving skills, testing and improving your ability to define a problem, identify the relevant concepts, and apply those concepts to obtain a quantitative answer. Everyone should recognize this process as common to all science and engineering.

- **Lecture** The goal of this course is to teach the main concepts of physics and how to apply these ideas in solving

physics problems. The lecture is primarily to help you develop a conceptual understanding and to show you how they can be applied. I will largely follow the book, providing further explanations and alternative explanations as well as doing demonstrations to illustrate concepts. Problem solving techniques will be discussed regularly, and any material presented in lecture, homework, or studio is fair game for an exam. So, I encourage you to attend lectures and ask questions. I will be using i-clickers throughout the semester as one form of active learning, so be sure to bring your i-clicker to every lecture.

- **Homework** You don't know whether you actually understand any of the concepts until you try to apply them yourself. Everything makes sense and looks simple in lecture — it's my job to make sure of that! The homework problems give you the opportunity to apply the concepts from lecture and combine them with problem solving. Doing the homework is probably the *single most important activity* in this class for learning and understanding the material. I will assign a challenging set of problems — twice a week. Expect to spend at least 10 hours outside of class each week to do the reading and other work needed to solve the problems.
- **Studio** Studio is your chance to integrate the concepts and problem solving from lecture and homework with hands-on lab exercises to see how physics works in practice. The emphasis in studios will be to strengthen your conceptual foundation in physics by integrating problem solving with a direct comparison to experiments. Your goal here should not be just to learn how to solve particular homework problems, but rather to understand how to apply physics concepts to solve any problem you might encounter in this course. Your studio instructors are an excellent resource for answering questions, so take advantage of the opportunity!

Ultimately, you will get out of this course what you put into it. None of your instructors can force you to learn, and they cannot magically put knowledge into your brain. Your instructors will do everything they can to make the process easier, but you have to do the hard work to master every concept. *You have to take responsibility for your own education.*

Point allocation and overall grade assignment:

Regular Exams	400	900–1000	A
Studio	400	800–899	B
Final Exam	200	700–799	C
	1000	600–699	D
		0–599	F

- **Regular Exams** There will be five exams throughout the semester, held on Fridays at 4:30. There will thus be an exam roughly every three weeks (the dates are listed on the homework and studio schedule), and they will focus on the material covered in the time since the last exam. Since the material builds on itself, however, each exam ends up being fairly comprehensive. The best four scores will be used to calculate your final grade. The exams will be held in rooms CW 101, 102, and 103. All exams will consist of a mixture of multiple-choice conceptual questions and analytical problems. Anything covered in the lecture, homework, text,

or studio is fair game. You must bring a working calculator to the exam, and an equation sheet will be provided for each exam. No notes, books, or other material may be brought to an exam or used during an exam. See the separate document for policies on missing/making-up an Exam.

- **Final Exam** Everything discussed above for Regular Exams applies to the Final as well. The final exam is mandatory and must be taken to pass the class. It will be given only at the scheduled time, although see the document on make-up policies.
- **Studio** See the separate studio syllabus for the detailed point breakdown and requirements. All studios will have the same structure — discussion of homework problems, laboratory exercises, and quizzes — although different instructors will organize these activities differently. The studios will be implemented as uniformly as possible. There will be no make-up studios, but the three lowest scores will be dropped. Nevertheless, it's best to attend all studios if possible. Your studio grade will be based on homework, lab write-ups, and in-class studio quizzes. Again, see the separate write-up for details.

Guidelines for homework:

- Discuss your homework with classmates as much as you like — this can be an efficient way to tackle a challenging course like Engineering Physics. But, write your homework solutions *on your own!*
- It is important that you attempt all homework problems before going to studio. That way, you can get the most out of the chance to discuss the problems in studio.
- The problems in this class can all be solved by the same general strategy. The book summarizes this strategy as "Picture, Solve, and Check". This is the strategy I will use in lecture and that you will see in studios. "Picture" means to visualize the physical situation, usually by drawing a diagram. This step includes identifying what quantity needs to be calculated. "Solve" means to write down the relevant equations and solve algebraically for the desired quantity, substituting numerical values at the end of the calculation. Finally, you should always "Check" to make sure that your answer makes sense. This means checking the order of magnitude and units, for instance. Get in the habit of following this strategy every time you solve a problem.

When you need help:

- Talk with your classmates.
- Ask questions — either in lecture or studio.
- Check the message board for the class on K-State online. With nearly 300 students in this class, there's a good chance that others have the same question as you. So, the answer might already be posted there or, if it's not, the answer might benefit many others.
- If you need more help than this, try your studio instructor's office hours or mine. I will usually be available through email, too, although you may not get an immediate reply. Email is suitable only for fairly simple homework questions, though.

- A Physics Help Room is also available. I will post details about its hours and location as soon as they are settled.
- If you still find yourself in need of help, make an appointment to talk with either your studio instructor or me, and we will do what we can. The best way to contact me to set up an appointment is through email.

Students with disabilities:

Any student with a disability who needs a classroom accommodation, access to technology or other assistance in this course should contact Disability Support Services and/or the instructor.

Academic Honesty:

Kansas State University has an Honor System based on personal integrity, which is presumed to be sufficient assurance that, in academic matters, one's work is performed honestly and without unauthorized assistance. Undergraduate and graduate students, by registration, acknowledge the jurisdiction of the Honor System. The policies and procedures of the Honor System apply to all full and part-time students enrolled in undergraduate and graduate courses on-campus, off-campus, and via distance learning. The Honor System website can be reached at www.ksu.edu/honor. A component vital to the Honor System is the inclusion of the Honor Pledge which applies to all assignments, examinations, or other course work undertaken by students. The Honor Pledge is implied, whether or not it is stated: "On my honor, as a student, I have neither given nor received unauthorized aid on this academic work." A grade of XF can result from a breach of academic honesty. The F indicates failure in the course; the X indicates the reason is an Honor Pledge violation.

Professionalism:

In addition to following the official KSU policies on academic dishonesty, I expect you to fully embrace the high standards of professionalism practiced by engineers and scientists, which go beyond the literal statement of the KSU honor code. A non-exhaustive set of examples of unprofessional behavior would include: using an i-clicker or WebAssign account other than your own, programming a calculator or other electronic device for the purpose of aiding your quiz or exam performance, and failing to contribute in studio to group laboratory or problem assignments. Note that the first two of these examples constitute actionable examples of academic dishonesty as well.

Professionalism extends to your behavior in class. Be aware that while in lecture, no activity that distracts other students will be permitted. Such activities include (but are not limited to) ringing cell phones, talking on a cell phone, talking to your neighbor, snoring — anything that makes noise. Such activities also include texting, reading a newspaper, or reading other material unrelated to class. You can use laptops (quietly!), but not to surf the web, play games, or anything else unrelated to class. Persistent abusers of these rules will be removed from class.

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