

# Physics 181 - University Physics (Spring 2012)

**Time & place:** Mon & Wed, 11:35am-12:50pm, Davies Auditorium. *Meets during reading period!*

**classesv2 site:** [https://classesv2.yale.edu/portal/site/phys181\\_s12](https://classesv2.yale.edu/portal/site/phys181_s12)

## Instructor & TF office hours:

TF: Natasa Mateljevic [natasa.mateljevic@yale.edu](mailto:natasa.mateljevic@yale.edu), JE dining hall, Sun 9:00pm-10:00pm  
TF: Chris McKitterick [chris.mckitterick@yale.edu](mailto:chris.mckitterick@yale.edu), Becton 404/411, Mon 2:30pm-3:30pm  
TF: Ankit Disa [ankit.disa@yale.edu](mailto:ankit.disa@yale.edu), Becton 301, Mon 5pm-6pm  
TF: Jukka Vayrynen [jukka.vayrynen@yale.edu](mailto:jukka.vayrynen@yale.edu), Sloane Phys. Lab 58, Tue 11:40am-12:40pm  
TF: Chao Lu [chao.lu@yale.edu](mailto:chao.lu@yale.edu), Anlyan Center (TAC) N303, Tue 11am-12am  
TF: Jingjing Kanik [jingjing.zhu@yale.edu](mailto:jingjing.zhu@yale.edu), Anlyan Center (TAC) N303, Tue 1pm-2pm  
TF: Kinga Partyka [kinga.partyka@yale.edu](mailto:kinga.partyka@yale.edu), Gibbs 570, Tue 3pm-4pm  
Instructor: Sohrab Ismail-Beigi [sohrab.ismail-beigi@yale.edu](mailto:sohrab.ismail-beigi@yale.edu), Becton 307, Tue 8pm-9pm  
TF: Matthew Reed [matthew.reed@yale.edu](mailto:matthew.reed@yale.edu), Becton 425, Fri 2pm-3pm

## Weekly review sessions & study halls:

Weekly review sessions: Monday and Tuesday, 7pm-8pm, Dunham 220

Study Halls: Sun, Mon, and Tue 9pm-12am in Jonathan Edwards (JE) dining hall

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## Required Materials:

1. **Textbook:** Halliday, Resnick and Walker, *Fundamentals of Physics*. There are many editions and the course officially uses the 9th. Any recent edition is probably OK: I will provide full problem statements for the written problem sets. I have put a large number copies on reserve in the library.

*Please ensure that the textbook version(s) you use has(have) all the material up to and including Chapter 40 (relativity, photons & matter waves, more about matter waves, all about atoms, ...)*

2. **Turning Point ("clickers"):** These are radio frequency remote polling devices that you get from Bass library. Each student gets a unique clicker with a unique ID. You are responsible for bringing the clicker to each lecture to answer the in-class questions which also determines your attendance. Coming to lecture is important for learning: the clicker questions provide important conceptual questions that form one of the pillars for learning the material (see "Course philosophy" below). You should use only your own clicker: clicking an absent person's clicker in class is a bad idea and will be treated as academic dishonesty. You must have your clicker registered on the Physics 181 classesv2 web site by 8am Monday January 23rd and ready for use that day in lecture and I will start "counting" the responses.

*It is your responsibility to write down your clicker number somewhere safe and to register the clicker promptly (and if you can not, to tell me the clicker ID). If your old clicker is lost or broken and you get a new clicker, it is your responsibility to tell me the new clicker number ASAP. The library will not give me this information under any circumstances for privacy reasons and does not keep records of who checked out which clicker (for reasons having to do with the Patriot Act). So please keep track of your clicker ID(s) and keep me informed of the clicker ID you are using in class in a timely manner.*

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## Homework, exams, grading, and other policies:

There are six components to your numerical score. The first four add up to 100% and the last two bonus ones can give an additional 5%. It is possible to get a 105% numerical score in this class.

1. **Weekly written problem sets (20%):** These are due on Wednesdays and I will endeavor to have them posted on classesv2 six to seven days before. The problem set is due by the start of lecture in a

box outside my office or upon entry into the lecture hall before lecture begins. After this cutoff, the homework is late and will be graded out of a maximum of 50% if dropped off by 4:00pm that Friday in the box. Later than that, the homework will not be graded. For grading issues, contact Sohrab first. At the end of the course, I will drop (i.e. ignore) the lowest two written homework grades you obtained and then average the remaining homework grades to get this portion of your score.

- 2. Pre-class online quizzes on classesv2 (10%):** Coming to lecture prepared is critical: otherwise you will not be able to follow what is going on, make sense of the clicker questions, or participate meaningfully in discussions. There will be a short online homework on classesv2 under "Tests & Quizzes" due 5 minutes before each lecture starts which will review material to be covered that day. This is a sharp cutoff and no late online quizzes will be accepted. At the end of the course, I will drop (i.e. ignore) your lowest seven quiz grades and average the remaining quiz scores to compute this portion of your score.
- 3. Midterms and final exam (60% total):** There will be two in-class midterms on Monday February 13th & Monday April 2nd and the final exam is scheduled for Tuesday May 1st at 2:00pm (group 34). Your three exam scores will be sorted in ascending order and weighed by 10%, 20%, and 30% respectively. Hence all exams count but your better scores count more. So if your three exam scores are A, B, C, and they have been sorted so  $A \leq B \leq C$ , then this part of your total score is given by  $0.1*A + 0.2*B + 0.3*C$ .
- 4. In-class participation (10%):** Attendance is critical as asking and answering questions and working in groups during lecture is an integral part of the course. The participation component is awarded if you answer at least 80% of the questions in class (correctness does not matter). Participation below 80% is scaled linearly: if there are N lectures for which participation was recorded and you attended M of them, then if  $M < 0.8*N$  your participation score as a percentage is  $10%*M/(0.8*N)$ , whereas if  $M \geq 0.8*N$  then it is 10%.
- 5. Participation bonus (+4%):** If you answer a clicker question correctly that at least 75% of your classmates get right and you do this at least 75% of the time, you get this bonus. Hence, it is advantageous to answer the questions correctly *and* to help your peers do the same.
- 6. Survey bonus (+1%):** Please fill in a knowledge survey on classesv2 at the beginning and end of the course. If you fill both, you earn this bonus (regardless of performance). The survey is under "Tests & Quizzes" and called "Beginning of term survey" and "End of term survey."

**Grading philosophy:** My objective is for you to learn physics. If you demonstrate excellent learning, you get an A; good learning gets a B; passing knowledge is worth a C. The previous sentence is the fundamental principle for converting numerical grades into letter grades. Historically, this has translated into A/B and B/C letter grade boundaries of *roughly* 90 and 80 respectively but the precise number varies from year to year depending primarily on the difficulty of the exams. What is guaranteed is that the higher your numerical grade, the better your letter grade.

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***Important policies and course philosophy:***

**Excuses:** The only acceptable excuses for missed homeworks or exams are written Dean's excuses and the instructor's permission. Remember that it is *your* job to inform us in a *timely* way of your excuse, whether you have a dean's excuse, that you handed in your homework in an unorthodox time and/or place, etc. If you don't communicate, we can't help you.

**Group work:** We do encourage you to work in groups, a proven and effective way to enhance learning (and it can be more fun). However, the final work that you hand in must be your own: your online and written homework as well as answers to in-class questions. Blind copying is both dishonest as well as detrimental to your learning and will inevitably catch up with you during the exams.

**Course philosophy:** This class is meant to teach you physics, and that is the primary objective. Getting a particular grade or distribution of grades is secondary. The class is designed to teach you physics in different mutually reinforcing ways: pre-lecture online quizzes help you integrate the reading and

to come to class with a prepared mind; in-class clicker questions are conceptual and help you see which concepts you have integrated and which ones still need work and also allow for group discussion where a great deal of learning takes place; the written homework allows you to practice the technical and computational skills necessary to solve physics problems; and the exams mix conceptual and technical aspects and allow you to integrate everything together in a coherent manner. Also, this means that the exam questions are not automatically going to look like the problem sets ones; that is not why I assign the problem sets nor it is their job!

*Like all serious intellectual endeavors, only you can learn and teach yourself the material. This class helps prepare your mind, gives you the needed tools, gives the right context, provide the background material, organizes opportunities for getting help and questions answered, etc. But learning can only take place when you spend the time and effort to do it yourself! Real learning occurs when you teach yourself. Fundamentally, you are expected to learn the material yourself and teach it to yourself. The teaching staff and entire class structure is devoted to help you in this endeavor, but we cannot “teach” you the material in any deep sense.*

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### **Help and other resources:**

- 1. Office hours:** You should take advantage of the TF and instructor office hours. For reasons not fully clear to the instructors and TFs, many students shy away from these office hours (especially the instructor ones), only discover this resource at the end of the term, and then explicitly voice their regret in not coming earlier to office hours; don't be one of those students!
- 2. Study hall:** The times and places for study halls will be announced soon. You are encouraged to attend regularly, work in small groups, and help each other. A few TFs and some instructors will be present to guide you or answer questions.
- 3. Classesv2 online discussion:** This is an online forum on classesv2. It allows for shared posted and threaded comments and questions. The idea is to discuss concepts, physics in the news, etc. This is a public space and posts cannot be deleted by you: so observe proper decorum and think before you post. Don't post solutions here as they will be removed.
- 4. Online Physics Applets:** These are educational and useful for seeing a simulation of key concept and systems; they have knobs to adjust parameters and to see what they do. Good sets of applets are <http://phet.colorado.edu/index.php> & <http://www.aw-bc.com/knight>.
- 5. Residential College Math & Science Tutoring Program:** provides in-college tutors for math & science courses. Check <http://science.yalecollege.yale.edu/tutoring> for times & availability
- 6. Individual Tutoring:** For students having particular difficulty. See your College Dean to get the form that must be signed by the instructor: it has questions about previous use of help resources, so you should already have taken advantage of other available help.
- 7. Peer tutors:** These are star students from previous years that have agreed to be personal tutors (one-on-one). Once we have a pool of them available, I will inform you about details.

Other useful information: the Yale college academic [calendar](#) and a more detailed one with [deadlines](#).