Physics 1116

Mechanics & Special Relativity : Fall 2021

Instructors

Professor : Eun-Ah Kim email : **ek436@cornell.edu**
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TA's : Eric San email : ys828@cornell.edu
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Grader: Andres Rios Tascon email : ar2285@cornell.edu

Texts & Required Materials

- *An Introduction to Mechanics*, by Kleppner & Kolenkow (K&K), 2nd edition
- *One **i-Clicker** personal transmitter,* available for purchase at bookstore

Class Times

Lecture :	**M W F** 10:10 - 11:00 AM	Rockefeller 203
Section 201 (Eric San) :	**T Th** 9:05 - 9:55 AM	Clark Hall 294A
Section 203 (Tyler Wu):	**M W** 12:25 – 1:15 PM	Clark Hall 294A
Section 204 (Tyler Wu):	**M W** 1:30 – 2:20 PM	Clark Hall 294A
Section 205 (Eric San):	**M W** 2:40 – 3:30 PM	Clark Hall 294G

Office Hours

Office hours will be announced some time during the second week of class, posted on Canvas.

Study Hall

A study hall will be open Friday afternoons from 1:15-5:15 pm in RCK110 starting on September 3. There will undergraduate TAs who have previously taken the course during the study hall, and other members of the course staff will visit the study hall at times as well. Attendance is entirely voluntary, but you must have worked on the problems on your own beforehand.

Online Course Information

All information, assignments, solutions, lecture notes, and handouts will be available online on the Physics 1116 Canvas, https://canvas.cornell.edu/

Problem Sets

There will be one problem set assigned each week, typically distributed on Friday and due the following Friday. They should be electronically submitted via Canvas **before 5:30 PM**. Solutions will be posted on Canvas in the evening after the problem sets are collected.

Problem sets will be graded largely on the basis of effort, as opposed to simply having the correct answer. Most homework problems will be graded coarsely. One or two problems each week will be selected as "write-up" problems, in which you should strive for clarity, precision, and (if possible) elegance in your presentation. Complete sentences are a bare minimum for the write-up problems, and these problems will be graded more carefully than the others.

Discussion and collaboration on the problem sets is encouraged, but you must first attempt to solve as much as you can by yourself. We have set up a "study hall" for students to gather to work on problems on which they have gotten stuck or could not solve themselves; however, you must have worked on the problems on your own before coming to the study hall. The ability to solve the problem sets **on your own** is the "gold standard" against which to assess your true understanding of the material. If you do discuss your work with other students, please write the names of the other group members on your problem set. Keep in mind that each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student's own work. Simply copying your classmates' problem sets will be self-defeating, as you will not have learned the material well enough to perform well on the quizzes and exams.

Solutions to pretty much any problem can be found on the web these days. You should resist the temptation. You will see problems similar to those in the problem sets through **QUIZ** and **EXAMS**. **You will regret it if you rely on internet for your homework.**

Exams

Prelim 1 :	Tuesday, Sep 21st, 7:30 – 9:30 PM	(TBA)
Prelim 2 :	Tuesday, Nov 2nd, 7:30 – 9:30 PM	(TBA)
Final Exam :	TBD	

Quizzes

A quiz will be given in section each week. *The quiz problem will be based on a problem from the previous week's problem set.* Therefore, you should study the posted solutions to the problem sets. Unlike the problem sets, the quizzes will be graded solely on the basis of correctness.

Bonus Points

An *extra credit or challenge problem* will be given at the end of some of the problem sets. These problems are meant to be very challenging brainteasers. Bonus points will be awarded only for correct answers and *you must work on these problems*

by yourself. A prize will be given at the end of the semester to the student who correctly solves the most extra credit problems!

Bonus points will also be awarded to students who *complete the pre- and post-course surveys, making a good effort on all questions*. The pre-course survey should have been emailed to everyone enrolled in the class last week.

Bonus points will also be awarded for *participating in the majority of the clicker questions*. The clickers will not be used to check attendance and incorrect answers will not count against you in any way. **Clickers must be registered in Canvas using the registration feature in the menu.**

Reading Assignments & Handouts

Reading assignments (from the textbook, K&K) for the next lecture can be found on the syllabus. You will greatly benefit by reading the assigned sections **before** lecture.

Grading

Prelim 1 :	*20 %*
Prelim 2 :	*20 %*
Final Exam :	*25 %*
Problem Sets, Labs, & Quizzes :	*35 %*
Bonus Points :	*See above*

To foster a collaborative atmosphere, Physics 1116 will not be graded on a curve. If you encounter conditions that make it difficult for you to work (physical, emotional, family crisis, etc...), please let me know as soon as possible so that we can discuss how to make any necessary accommodations.

There will be no make-ups allowed for missed quizzes, but **your lowest quiz score will be dropped**. Problem sets must be turned in on Fridays before 4pm, but **your lowest problem set score will be dropped.** Those who complete (by answering every question) *both* the pre-test and the post-test will be able to drop one additional quiz score (from four of your lowest scores, to five).

Physics 1116 vs. Physics 1112

Physics 1116 and 1112 are both calculus-based introductory mechanics courses suitable for majors in physics, astronomy, applied physics, engineering, and other related fields. Since the lecture times for 1116 and 1112 are the same, it will be easy to switch from one to the other in the first couple weeks of the semester (but the earlier, the better). You will be allowed to switch between the two courses until **September 9th**. Danyel Wierson (Clark 121) will handle all switches and please inform your instructors. We would suggest that you try the first couple problem sets and quizzes before making a decision. Some differences between the two classes are :

- Physics 1116 is more abstract and requires greater mathematical sophistication than Physics 1112. Familiarity with calculus is essential for Physics 1116
- Physics 1116 covers Einstein's Theory of Special Relativity (1112 does not, but Physics 2216 is a short course on Special Relativity to supplement 1112)
- Physics 1116 emphasizes more in-depth problem solving, somewhat similar to working on puzzles or logic problems, while Physics 1112 emphasizes more concrete and straightforward examples
- Physics 1116 moves along much faster than Physics 1112, assumes some familiarity with Newtonian mechanics, and covers more topics

A strong existing background in physics (such as AP Physics B and C) and calculus is encouraged for Physics 1116. This class is intended to be challenging for students that have already taken AP Physics in high school. We will introduce more sophisticated problems than you have previously encountered, and will also work towards developing your intuition and problem solving abilities in physics – you will learn how to start thinking like a physicist. If you want to be a physics or engineering physics major, but have less preparation in physics and/or calculus than is needed for Physics 1116, you can still take Physics 1112 and continue on as a physics major.

Physics 1116 is significantly more challenging and will likely take a fair amount more effort than Physics 1112, but hopefully you will find it correspondingly rewarding as well. We do our best to try to adjust the grades in Physics 1116 so that they should reflect what we think you may have gotten if you had put in a similar effort to Physics 1112. We do not want to penalize you simply for taking a more challenging course. (It is not uncommon for the median grade for Physics 1116 to be higher than Physics 1112, but this does NOT mean that you are guaranteed a better grade by taking Physics 1116!)

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