

Physics 1116: Mechanics and Special Relativity

Fall 2022

Cornell University Department of Physics

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Time Zone Convention: All times quoted throughout the course are US Eastern (Ithaca).

Instructors

Primary Instructor: Jared Maxson, jmm586@cornell.edu

Office Hours: Wednesdays, 4-5:15 pm.

Office: PSB 387

Teaching Assistants: Eric San (ys828@cornell.edu) and Yifei Liu (yl3295@cornell.edu)

Office Hours: by appointment.

Lecture: MWF, 10:10-11:00 am, Rockefeller Hall 203

Discussion Sections: All discussion sections take place in Rockefeller Hall 110

DIS 201 (Yifei)	DIS 202 (Eric)	DIS 203 (Yifei)	DIS 204 (Eric)
T+R 9:05-9:55 am	M+W 12:25-1:15 pm	M+W 1:30 - 2:20 pm	M+W 2:40-3:30 pm

Note: You must attend the discussion section in which you are enrolled.

Homework Parties: Thursday afternoons (4-8 pm), Clark Hall 294E

Textbook: Kleppner and Kolenkow, *An Introduction to Mechanics*, second edition.

All registration issues (add/drop, section assignments) are handled by Danyel Wierson (dw442@cornell.edu). Do not contact the course staff about registration issues, as we have no control over the section assignments.

Grading Breakdown:

- Prelim 1: 15%,
- Prelim 2: 25%
- Final: 30%
- Everything else: 30% (Problem Sets, Quizzes, Participation)

Weekly Quizzes: will take place in the first discussion section of the week. Your lowest quiz score will be dropped. If you complete the departmental pre and post survey (see your email), *you can drop an additional quiz.*

Prelim Schedule: Our first Prelim (this is the Cornell term for “exams that aren’t the final”) will take place *in class* on 9/12/22, location TBD. Our second prelim will take place on 10/25/2022 in Goldwin Smith Hall, room G76, at 7:30 pm.

Final Exam time: TBD, scheduled by the university (your instructors don’t control this).

Homework: Homework is due on **Fridays at 5pm**. Homework submission is handled through *Gradescope*. Your lowest homework will be dropped, and you are permitted to submit one assignment up to one week late, because things happen! Homework is graded on both accuracy, effort, and presentation. All homeworks count equally.

Prof Maxson assigns letter grades. The system used is neither an absolute scale, nor does it strictly conform to a normal distribution. The system we use is generally more lenient than a traditional “curve”. We’ll have grade discussions about what scores approximately correspond to what letter grades after each prelim.

Academic Integrity: 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.

Announcements will be typically posted to our Canvas site.

What do we do in discussion section?

Your discussion sections are led by teaching assistants who are graduate students pursuing their PhD in physics. You’ll have two discussion sections per week. Your first discussion section starts with a **quiz**. This is a roughly 10 min-long problem or problems *that will be very similar to a portion of previous homework submitted the week before. No big surprises*. Quizzes are graded on accuracy. For the remainder of the first discussion section, and the whole of your second discussion section, you’ll work on problems alone and in groups, and there will be time for freeform Q+A about the material with your TA.

What do we do in homework parties and office hours?

We give you help! Homework parties are meant to be a place for you to work together with your peers on the weekly problem sets, with guidance from your instructors. The setting is very informal.

Office hours are a great way to get individual (or small group) help on homework assignments, and to discuss all other aspects of the course, including study strategies and performance optimization.

An important note: **you must have attempted the homework before attending the HW party.**

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. It should be straightforward to switch from one to the other in the first couple weeks of the semester (but the earlier, the better). Danyel Wierson 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)
- Physics 1116 attempts to make deep connections to advanced physics concepts where possible
- 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 background in physics (such as AP Physics) and calculus is encouraged for Physics 1116. This class is intended to be challenging for students that have already received AP credit.

We will introduce more sophisticated problems than you have previously encountered and will develop your intuition and problem-solving abilities. 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.

Where to go for help, questions or concerns: In general, all of the course staff, *including Prof. Maxson, are more than happy to meet with you to discuss questions or concerns. We want you to succeed!* Please don't be afraid to ask to set up an appointment or to come to office hours.

Common questions and concerns, and who to contact are listed below:

- If you'd like to discuss grading on a particular HW or Exam problem, please either submit a regrade request through gradescope or message the grader. The grader will then contact Prof M if more help is needed.
- Do you think there is an error or typo in the lecture notes or in the HW? For homework, please contact your TA, and for Lecture, please contact Prof M. We appreciate your help identifying these and like to correct them ASAP!
- If you are struggling with the course content and/or would like advice on how to optimize your approach, please let your TA and Prof M know. Your TA will specialize in helping you with the subject matter, and Prof M is happy to work with you both on subject matter and on general study and exam prep strategies.

Please reach out to Prof M directly for the following:

- If you are concerned about your grade and would like to discuss your standing in the course. Note: We have a course-wide discussion of estimated grade boundaries after each prelim.
- If a life event or medical complications will significantly change your ability to participate for an extended period of time.
- If you require special accommodations for any aspect of the course.

A final note from Prof M:

Cornell University (as an institution) and I (as a human being and instructor of this course) are committed to full inclusion in education for all persons. Services and reasonable accommodations are available to students with temporary and permanent disabilities, to students with DACA or undocumented status, to students facing mental health issues, other personal situations, and to students with other kinds of learning needs. Again, please feel free to let me know if there are circumstances affecting your ability to participate in class. Some resources that might be of use include:

- Office of Student Disability Services, <https://sds.cornell.edu/>
- Cornell Health CAPS (Counseling & Psychological Services), <https://health.cornell.edu/services/counseling-psychiatry>
- Undocumented/DACA Student Support, Kevin Graham (Kevin.Graham@Cornell.edu), list of campus resources can be found here: <https://dos.cornell.edu/undocumented-daca-support/undergraduate-admissions-financial-aid>
- Learning Strategies Center, <http://lsc.cornell.edu/>

I would be glad to help you identify other resources if needed.