

### Course Information

#### Instructors:

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Text: Young and Freedman, *University Physics*, 13<sup>th</sup> ed. Vol.1, with Mastering Physics.  
Available at Amherst Books.

Prerequisite: **Math 111, the first semester of calculus, or its equivalent. You must either have taken Math 111 (or its equivalent) or placed out of it. If you are not sure you meet the requirement, please see the instructor right away.**

Assignments: Readings from the text and homework problems will be assigned weekly. The readings will help prepare you for the material to be covered in the lectures, and you should read them in advance of the corresponding lectures. The problems constitute a relatively small portion of the grade, but that belies their importance. They are absolutely necessary in attaining the sort of functional understanding of physics that is the goal in this course. If you slack off in doing the homework, you will undoubtedly suffer when it comes to the exams. You should try to work the problems thoroughly and seek help only after you've banged your head on them a bit. Working problems with your fellow classmates will help you avoid pitfalls and mitigate frustration. Rules for collaboration and citation of sources on homework are detailed in the Statement of Intellectual Responsibility below.

**Homeworks will be due each Tuesday at 10 am.** Homework is to be turned in to the yellow box outside Prof. Friedman's office. Late homework presents severe organizational problems (the graders need to get the homeworks in a timely manner). As a consequence, the following **strict** rule applies: Late homework will be accepted until 5 pm the day it is due, but will only receive half credit. Anything turned in after 5 pm will not receive credit, although it will be "graded" to give you feedback.

You will also be assigned some problems from Mastering Physics, an on-line homework and tutorial system. You will generally be asked to complete one or two Mastering Physics tutorials before each class meeting. To access Mastering Physics, you will need the student access code that comes with your textbook. Go to [masteringphysics.com](http://masteringphysics.com) to log in. You will also need the Course ID: PHYSICS116

**Get started on the homework early. Do not wait until the last minute!**

Personal Response System: We'll be using the PRS system in class. During a typical class, you will be asked to respond to a few multiple-choice questions relating to the topics you are learning. For some of these questions you will be asked to discuss the question with your classmates. You will be graded for both participating and submitting correct answers to these questions. In order to use the PRS system, you will need a "clicker," which you can borrow for the semester from IT. If you return it intact at the end of the semester, there will be no charge to you. If you lose or break your clicker, you will be responsible for the cost of replacement. **You should get your clicker from IT (Seeley Mudd 110) before the second class (Wednesday, Jan. 25).**

Exams and Quizzes:

There will be two short (~15 minute) in-class quizzes during the second and third weeks of the semester.

There will also be two midterm exams during the course. These will be held in the evenings in Merrill 1 (our regular lecture hall):

Midterm #1: Wednesday, Feb. 22, 7-9 pm

Midterm #2: Wednesday, April 4, 7-9 pm

There will be a three-hour comprehensive final exam to be scheduled by the Registrar. The exams will cover material from the text, lectures, homework and labs.

Labs: The labs are an integral and important part of the course. Some of the labs will have formal written lab reports; others will be evaluated by informal "exit interviews."

The schedule of experiments is included in the attached syllabus. The Physics 116 Lab Manual, will be distributed during the first week of the course and is posted on the course web site. Before coming to the first lab session, you should read the *General Instructions* section at the beginning of the manual and Appendices B, D and E at the end. Before each lab meeting, you should carefully read through the corresponding section in the lab manual. Your lab instructor will generally make some introductory comments about the experimental apparatus at the beginning of the lab, but will assume that you have read the lab itself and have a general idea what the physics goal is and what measurements you'll have to take.

You will be provided with a laboratory notebook at the first lab meeting. It should be used only for this class since notebooks may be collected for grading at the end of some lab meetings.

Labs will meet in Merrill 200. Please arrive promptly the initial part of lab time will be used for lab instruction, safety recommendations, etc. You should anticipate spending the full 3 scheduled hours to complete the lab.

Details of what we expect from you in the labs will be described in the first lab period during the first week of class. Labs are a required part of the course. **You cannot pass the course without successfully completing all labs.**

Late lab-report policy: If you turn in a formal lab report late, you will receive a 20% grade penalty for every 24 hours the report is overdue.

Grades: Your grade for the course will be based on the following weighting:

Homework	10%
PRS	5%
Quizzes	5%
Midterm exams	30%
Labs	25%
Final Exam	25%

Additional help:

Of course, you are encouraged to utilize the instructors' office hours. In addition, evening problem/review sessions will be run by an undergraduate TA.

Mastering Physics has a "Study Area" with video demonstrations and tutorials, links to simulations and more.

You are encouraged to take advantage of the Moss Quantitative Center for help. It is conveniently located at 202 Merrill. Details can be found on the Q Center's web page.

The Peer Tutoring program is run by the Office of the Dean of Students. If you need a few hours a week of tutoring they can provide you with a tutor, often a physics major. Contact the instructor or the Office of the Dean of Students for details.

**Statement of Intellectual Responsibility:**

Homework Assignments – You are encouraged to work with other students on your homework, but what you turn in must represent your own understanding of the problem. Copying a solution from another student or from a published source will be considered a

violation of intellectual responsibility. This rule applies to solutions posted on the internet (such as, but not limited to, cramster.com).

PRS – You must submit your own answers to the PRS questions. Do not look at what other students are submitting with their clickers. Never press the buttons on another person's clicker or ask someone to submit answers for you.

Labs – Discussion and cooperation between lab partners is encouraged during the lab session. Both partners should share equally in the collection of data. However, each student must keep a **separate record** of the data and do all calculations *independently*.

It is important to preserve the integrity of data. Use of any data or calculations other than one's own and "fudging" of data (adjusting a number to something other than what you observed) are considered violations of the principles of Intellectual Responsibility. Lab reports must be written entirely by you and must represent your own understanding of the work you have done. You cannot simply copy what others have told you.

Exams – The exams will be closed book. You will not be allowed to collaborate with anyone during an exam. What you submit must be entirely your own work.

**Approximate Syllabus**

<u>Week of</u>	<u>Course Topics</u>	<u>Course Events</u>
Jan. 23	Introduction, Units & Vectors	Read Chapter 1 of Young and Freedman <b>Intro Lab Meeting</b>
Jan. 30	Motion in 1 dimension	Chapter 2, First HW due Tuesday 1 <sup>st</sup> Lab: Force Table (Informal) <b>QUIZ</b>
Feb. 6	Motion in 2 & 3 dimensions	Chapter 3; HW 2 due 2 <sup>nd</sup> Lab: Free Fall (Formal) <b>QUIZ</b>
Feb. 13	Newton's Laws	Chapters 4; HW 3 due 3 <sup>rd</sup> lab: Bouncing Ball (Informal)
Feb. 20	Force Laws: Applying Newton's Laws	Chapter 5; HW 4 due <b>No lab</b> <b>First Exam Wednesday (2/22), 7-9 pm</b>
Feb. 27	Gravity and Planetary Motion	Chapter 13; HW 5 due <b>No lab</b>
March 5	Work & Kinetic Energy	Chapter 6; HW 6 due; 4 <sup>th</sup> lab: Acceleration on an inclined plane (Formal)
March 12	Potential Energy, Conservation of Energy	Chapter 7; HW 7 due 5 <sup>th</sup> lab: "Outward" Force due to Rotation (Informal)
March 19	<b>Spring Break!</b>	
March 26	Conservation of Momentum, Collisions	Chapter 8; HW 8 due 6 <sup>th</sup> lab: Conservation laws in collisions (Informal)
April 2	Simple Harmonic Motion	Chapter 14; HW 9 due <b>No Lab</b> <b>Second Exam Wednesday (4/4), 7-9 pm</b>
April 9	Mechanical Waves	Parts of Chapters 15 and 16; HW 10 due 7 <sup>th</sup> lab: The Ballistic Pendulum (Informal)
April 16	Rotations	Chapter 10; HW 11 due 8 <sup>th</sup> lab: Simple Harmonic Motion (Formal)
April 23	Torque	Chapter 11; HW 12 du 9 <sup>th</sup> lab: Waves on a String (Informal)
April 30	Conservation of Angular Momentum and Wrap Up	HW 13 due <b>No Lab</b>

**Final Exam to be scheduled by Registrar during exam week**