

Introduction to Applied Math and Physics

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Office Hours: Mondays, 4:30 pm - 5:30 pm
Thursdays, 11:00 am - 12:00 pm
Can be available at other times upon request.

Course Description

“We live in a world governed by physical laws. As a result we have become accustomed to objects’ motions being in accordance with these laws. This course examines the basic physics and mathematics governing natural phenomena such as light, weight, inertia, friction, momentum, and thrust as a practical introduction to applied math and physics. Students will explore geometry, trigonometry for cyclical motions, and physical equations of motion for bodies moving under the influence of forces. With these tools, students will develop a broader understanding of the impact of mathematics and physics on their daily lives.”

Course Objectives

This course will explore basic physical principles including: inertia, weight, friction and momentum. It will also provide skills in the geometry, trigonometry and algebra needed to solve related problems. Applications to animation and every day life will be emphasized.

Textbook:

Sears and Zemansky’s College Physics, 9th Edition, Young and Geller
Chapters 0- 10

Grading (out of 100 points):

25 - Homework (approximately weekly)
5 - Participation (please see Attendance Policy)
10 - Quizzes (approximately every two weeks)
25 - Midterm
35 - Final

The course grade may or may not be ‘curved.’ This makes it a poor policy to depend upon a curve for one’s grade.

Attendance Policy

Attendance in class is vital to success and can be positively correlated with final grades. Students are expected to attend all lectures during the semester and arrive on time. Furthermore, there are quizzes every two weeks and assignments due in class. Each student starts out with 5 points for attendance. Missing more than 2 classes will result in a loss of points.

The policy for attendance grading is summarized in this table:

<i>Number of classes missed</i>	<i>Participation points lost</i>
7	5
6	4
5	3
4	2
3	1
2 or less	0

Homework

Problem sets are assigned to aid in understanding of the material and are due at the beginning of class on the due date. You are welcome to work with other students, so long as the aim is furthering your understanding of the concepts and problem solving techniques. I am happy to help work through problems, either in office hours or in class. Just remember, doing a problem yourself is very different from watching another person do so, and there is no such promise of succor for the examinations.

In addition, some exam questions may be similar to homework questions, so you're encouraged to fully understand what you turn in.

Late homework is not accepted, unless there is an excused absence.

Extra-credit homework problems: Usually, each assignment contains 1 or more extra-credit problem(s).

Requirements for handing assignments:

- Your assignment must contain a cover sheet displaying your name, the course name (PHY 115), the number of the assignment (e.g., Assignment 1) and the date you turned it in. Nothing else should be written on the front page of the cover sheet. Please do not fold your assignment.
- Assignments must be turned in immediately after we go over the problems in class.
- The assignment must be stapled.
- Assignments can be typed or handwritten. Handwritten assignments must be neat.
- All numerical answers must be boxed.
- Please show your work. Numerical answers with no supporting work will only receive partial credit.
- If you have an excused absence, please email me prior to dropping off the homework in the mailbox.

- If you wish to change your solution to a problem after we go over this problem in class, please write "as worked in class" in the solution.

Exams and quizzes

All exams and quizzes are closed book. A scientific calculator is required. One sheet of notes is permitted for an exam or quiz. This sheet of notes must be handwritten by you, and no larger than a 'normal' (8½" x 11") piece of paper. Front and back of the page may be used.

The midterm will cover all material taught up to the exam date. The final exam will be cumulative and comprehensive, with emphasis on areas not covered in the midterm. Any material covered in the course is valid for testing; including concepts covered in lecture, homework, or other communications and/or assigned work. Concepts in this course build upon each other and problem-solving techniques from any topics in the course may be required.

Make-Up Exams: Arrangements for make-up exams must be made with the instructor at least 24 hours in advance. Absences from school on the day of the exam due to illness must be excused with a doctor's note in order to qualify for a make-up exam. Make-up exams not fitting these criteria will not be offered.

Missing Class: If a student does miss class it is his/her responsibility to check in with the instructor upon his/her return either by email or in person.

Calculator Policy: Calculators are required for exams and quizzes. You may use calculators on exams for basic mathematical operations. You may not use your calculator to store formulae or text. You may not use your smartphone, laptop or tablet as a calculator.

Academic Integrity Policy

"Copying or plagiarizing code, papers, or presentations; cheating; and/or academic dishonesty in any form will not be tolerated in this course. Penalties for such behaviors may include receiving no credit for an assignment, a failing grade in the course, or even expulsion from the institution (DigiPen). For further details please consult the DigiPen Academic Integrity Policy."

Disabled Student Services

"Students with physical, psychological, or learning disabilities that affect their ability to perform major life activities associated with this class may be eligible for reasonable accommodations under the Americans with Disabilities Act. If you have a documented disability please contact the Disability Support Services office to arrange for accommodations for this class."

Cell Phone Policy

Cell phones are to remain off and unanswered in class without express permission of the instructor. This includes calls, text messages, or any other functionality your cell phone might contain.

General Course Outline

The approximate order and general outline of the course will be as follows:

<i>Timeline</i>	<i>Topic</i>	<i>Approximate Book Chapters</i>
Week 1	Introduction & mathematical review	
Week 2	Vectors, dimensional analysis, & unit conversions.	Ch. 1
Week 3	Motion with constant acceleration. Kinematics.	Ch. 2
Week 4	Projectiles, relative motion, and reference frames	Ch. 3
Week 5	Forces & Newton's Laws	Ch. 4
Week 6	Review and Midterm	
Week 7	Equilibrium	Ch. 5
Week 8	Circular motion	Ch. 6
Week 9	Work and Energy	Ch. 7
Week 10	Non-conservative forces: friction and drag	Ch. 7
Week 11	Flexible scheduling	
Week 12	Momentum & Collisions	Ch. 8
Week 13	Rotational motion	Ch. 9
Week 14	Rotation dynamics and final topics (if time permits)	
Week 15	Review and Final exam	All material.

This entire syllabus, particularly the timeline, may be adjusted or changed at any time by the instructor.