Physics 2A: General Introductory Physics - Mechanics, Winter 2022

Instructor Peter Ho **CRN# 01788** & **31893**

Contact hopeter@fhda.edu **Sections 30Z** & **32Z**

Days:
Lecture Tuesday and Thursdays from 5:30 PM to 7:20 PM
Labs Tuesday and Thursdays 7:30 PM to 10:20 PM

Location Online, Zoom meetings to be scheduled on Canvas with link.

Office Hour By appointment, see schedule of availability on Canvas.

Textbook

The textbooks we will be using will be used primarily as references, but not a necessary component or required for the course. We will be referencing the following texts in no particular order:

1. OpenStax: *College Physics*, is free to access online!
2. Fundamentals of Physics by Halliday and Resnick (any edition)
3. Physics for Scientists and Engineers by Serway and Jewett (any edition)

The required reading will however be assigned from OpenStax. But all three texts would help with solving problems and assignments.

Required Materials

A working computer with access to internet and a scientific calculator.

Prerequisites

Math 1A: *Calculus* or concurrent enrollment in Math 1A.

Course Description and Objectives

In this course, we will uncover the fundamental laws governing physics of bodies in motion. Known as Newtonian mechanics, describes the motion of bodies in a mechanical system. We begin the course with an overview of mathematical reasoning with functions to finding solutions to systems of equations. Then building towards a physical interpretation of motion we express the equations of motion through vectors geometrically and analytically. With vectors come Newton's law of motion, which will be fundamental in developing the concept of force. The development of momentum, momentum equations, and impulse arise from the equations of force. Finally, these concepts combined give us an overview of bodies of a system through total energy and work.

Student learning objectives in this course are to apply critical thinking skills with problem solving using mathematics. Beyond problem solving in a classroom setting, students are to learn laboratory skills and techniques applicable to real-world problems. Data analysis and interpretation of uncertainty are a few standards students will develop over the course of the quarter.

Grading Criteria and Lab Requirements

The lecture portion of this course will consist of weekly homework assignments, quizzes, lab assignments, and a midterm. **This is a cumulative course with each assignment graded with the given weights.**

Assignment	Point Distribution	% total grade
Homework $\times$10	100 points total $\Leftrightarrow$ 10 points each	23 %
Lab $\times$10	100 points total $\Leftrightarrow$ 10 points each	23 %
Quiz $\times$9	135 points total $\Leftrightarrow$ 15 points each	31 %
Midterm $\times$1	50 points total	11 %
Final $\times$1	50 points total	11 %
Course Total	435 points	100 %

This course will not be graded on a curved scale. Therefore, the grade distribution follows the standard grading scheme, meaning that A+: 96-100%, A: 93-96%, A-: 90-93%, ...

On Student Commitment

Learning physics, especially electricity and magnetism, can both be rewarding and demanding for its abstract concepts. But, for every reward, there is an equal amount in work to meet the demand, and maintaining an understanding of the material. A recommendation is to commit at least eight hours per week, or double the amount in class time outside of the classroom to complete assignments and prepare for the exams. In addition, and to some level of abstraction, the ability to connect physics concepts to mathematical formulation is a necessary component to this course. Solving problems through the means of linear expressions, and through means of calculus are necessary to solving problems in this course.

Exams

There will be one midterm for the quarter followed by a final exam at the end. Exam coverage comes for all previous homework and quiz topics leading up to the exam (i.e. cumulative).

On the format of the exam: exams will be an open note and open book type of exam due within an hour time limit. Students must show all work with reasoning that guides the reader to the desired solution. **Simple math work will not be sufficient as a solution. EXPLAIN YOUR WORK.**

Quizzes

There are a total of nine quizzes assigned each week as a take-home assignment. Quizzes are graded out of 15 points each with each problem (three) worth five points each. Quizzes are open book and open note, and students may collaborate.

Homework

Homework will be assigned at the start of each week, meaning that there will be an assignment **due every Tuesday at 5:30 PM**.

Classroom Policy and Participation with Extra Credit:

While there is no requirement to turn on your camera during class, it is also courteous to have all microphones muted except for the instructor. Please be present as possible with some classroom participation. Participation lends to bonus and/or extra credit applied to the final grade. So, contributing to class discussion would only improve your grade, really.

Tentative Class Schedule

The general agenda for the class goes as listed on a weekly basis. Please keep in mind that this is tentative and is subject to change throughout the quarter.

Week	Topic of The Week	Assignments	Exam / Quizzes
1/3 - 1/7	Review of Math	HW #1 / Lab #1	Quiz 1
1/10 - 1/14	Vectors	HW #2 / Lab #2	Quiz 2
1/17 - 1/21	Equations of Motion	HW #3 / Lab #3	Quiz 3
1/24 - 1/28	Kinematics	HW #4 / Lab #4	Quiz 4
1/31 - 2/4	Newton's Law of Motion	HW #5 / Lab #5	Quiz 5
2/7 - 2/11	Imulse and Momentum	HW #6 / Lab #6	**Midterm**
2/14 - 2/18	Work and Energy	HW #7 / Lab #7	Quiz 6
2/21 - 2/25	Rotational Kinematics	HW #8 / Lab #8	Quiz 7
2/28 - 3/4	Angular Momentum and Torque	HW #9 / Lab #9	Quiz 8
3/7 - 3/11	Oscillations and Harmonic Motion	HW #10 / Lab #10	Quiz 9
3/14 - 3/18	A Brief History of Physics	Extra Credit	Review
March 22nd	**6:15 PM - 8:15 PM**	**Tuesday**	**Final Exam**

On Academic Integrity

This course will be held online for the entirety the quarter. This means that academic integrity is at the forefront of leading issues for students and instructors taking classes online today. We are committed to upholding the values of a community college to ensure the integrity of student work and personal effort in their academic role. As an agreement to these terms each student must abide to their role upholding the values of academic integrity.

In other words, as an enrolled student of De Anza College, students must agree to upholding the values put forward by Foothill's statement on academic integrity. A student will accept that by taking on the risk of copying the work of others without credit, that he or she accept a zero for the assignment or exam. In addition to the risks, there are online services and forums where students may post questions for answers. Therefore, **one will not rely** on these resources other than for understanding course material leading up to a test. Other resources include, and are not limited to working with others over communication applications during an exam.

Final Grade Policy

In fairness of all students in the class, students will agree to the following policy in determination of final grades:

1. Grade "bump" requests and emails regarding changes in the final grade will be ignored after the final.
2. NO late assignments will be accepted after the final.
3. Course grades are posted as accurate and current on Canvas.
4. Grade distribution follows standard grading scheme (A+: 96% - 100%).
5. Any minor adjustments to grade is solely up to instructor's discretion.

Student Learning Outcome(s):

*Critically examine new, previously un-encountered problems, analyzing and evaluating their constituent parts, to construct and explain a logical solution utilizing, and based upon, the fundamental laws of mechanics
*In order to test lab skills students are expected to gain confidence in taking precise and accurate scientific measurements, with their uncertainties, and then with calculations from them, analyze their meaning as relative, in an experimental context, to the verification and support of physics theories.