COURSE SYLLABUS

PHYS 1536 Introductory Mechanics

Spring 2025

Instructor: TBA

Email:TBA

Field: Physics

Credits: 4

Course Description

This course provides an introduction to the fundamental concepts of mechanics, covering the dynamics of particles and rigid bodies using vectors and calculus. Students will explore topics such as conservation of energy and momentum, as well as kinetic theory. These concepts serve as the cornerstone for understanding various principles in the physical sciences and engineering disciplines.

Learning Objectives

By the end of this course, students will be able to do the following:

- Understand the basic principles governing mechanics, including trajectories, forces, and Newton's Laws;
- Understand and use conservation of energy, work, kinetic energy, and power;
- Understand conservation of momentum;
- Interrelate momentum and impulse.

Pre-requisites: MATH 1526 Introduction to Calculus I

Required Text/Readings:

Taylor J(2004). ***Classical Mechanics***. University Science Books.

Accessibility Services (Accommodations)

Students with documented academic, medical, emotional, and/or physical disabilities, who require accommodation, must provide current documentation

attesting to the specific nature of their disability to Academic Accommodations Coordinator and Associate Registrar. Students are responsible for submitting the appropriate documents and forms in a timely manner. A meeting to review documentation and discuss accommodations is strongly recommended.

Academic Honesty

Please read the relevant section of the College's policy on academic honesty in the student Code of Conduct. Briefly academic dishonesty includes: cheating, fabrication, and plagiarism. Please ask me if you have any questions about whether something constitutes academic dishonesty. Academic dishonesty will not be tolerated and will result in failure of the course. Institutional penalties may also apply.

Attendance Policy & Class Participation

Your attendance and participation will be formally graded. Experiential learning is an important component of this class. You are required to complete required readings, watch lecture videos, and engage in online class activities.

You are required to submit assignments/exams ON TIME. Any late assignment will result in a deduction of points that may affect your final grade. If you know that you will have a conflict with a due date, or if you are having problems with any assignment, especially those that lead to you submitting the assignment late, you need to plan in advance so that we can discuss the situation and an alternative arrangement (hopefully) can be made that is mutually beneficial.

Active learning is more efficient than passive learning, and therefore, will save your time.

Evaluation of Performance

Final Grading

Your grade will be based upon your performance on exams, assignments, and participation.

6 Labs and Lab Reports	30%
2 Quizzes	20%
Midterm Exam	20%
Final Exam	30%
Total	100%

Grades will be assigned as follows:

Grade		Grade	
A	(93- 100%)	C	(73-76%)
A-	(90-92%)	C-	(70-72%)
B+	(87-89%)	D+	(67-69%)
B	(83-86%)	D	(64-66%)
B-	(80-82%)	D-	(60-63%)
C+	(77-79%)	F	(<60%)

Last but Not Least

This syllabus is tentative and is subject to change. Any changes will be announced on multiple occasions and as far ahead of time as possible. It is your responsibility to be aware of any changes that occur.

Tentative Schedule of Topics

Module	Topic	Required Readings
1	Introduction to Newtonian mechanics Kinematics: Motion in one dimension Kinematics: Motion in two and three dimensions Newton's laws of motion Lab #1	Chapter 1 Chapter 2
2	Forces and dynamics Friction and forces of constraint Work, energy, and power Conservation of energy Lab #2	Chapter 4 Chapter 5 Chapter 6
3	Systems of particles Center of mass and linear momentum Angular momentum and torque Rotational motion Lab #3	Chapter 7 Chapter 8

4	Equilibrium and elasticity Oscillatory motion Simple harmonic motion Damped and forced oscillations Lab #4	Chapter 10 Chapter 11
5	Waves and wave mechanics Introduction to fluid mechanics Thermal physics and thermodynamics Kinetic theory of gases Lab #5	Chapter 12 Chapter 13
6	Laws of thermodynamics Entropy and heat engines Statistical mechanics Special topics in classical mechanics Lab #6	Chapter 14 Chapter 15