PHY 301: Mechanics

Physics 301 is designed for beginning students of science and engineering. There are two levels of understanding in physics. The first is conceptual understanding. The emphasis here is on ideas, concepts, and qualitative knowledge. However, since a complete and precise statement of the laws of physics and their consequences and implications involves mathematical equations, a full understanding of physics necessarily involves numbers and mathematics. This is the second level of understanding. Though both levels of understanding are important, the emphasis in this course is on level-two understanding, or on numerical problems.

Requirements

To succeed in this course students should have successfully completed high school physics, as well as an introductory college-level course in calculus.

Course Organization

This course is divided into five learning modules containing a total of fifteen lessons. Each lesson contains a statement of learning objectives, a reading assignment, written instructor commentary, and example problems. All lessons within a learning module must be completed before moving onto the next module. An instructor is available via a message center to provide feedback and respond to questions.

Topics include:

Module 1
Lesson One: Space, Time, Mass, and Vectors
Lesson Two: Kinematics in One Dimension
Lesson Three: Kinematics in Three Dimensions

Module 2
Lesson Four: Dynamics - Newton’s Laws
Lesson Five: Applications of Newton’s Laws
Lesson Six: Work and Energy, Conservation of Energy

Module 3
Lesson Seven: Gravitation
Lesson Eight: Systems of Particles, Collisions
Lesson Nine: Kinematics of a Rigid Body

Module 4
Lesson Ten: Dynamics and Statics of a Rigid Body
Lesson Eleven: Oscillations
Lesson Twelve: Fluid Mechanics
Module 5
Lesson Thirteen: The Ideal Gas and Kinetic Theory
Lesson Fourteen: Heat
Lesson Fifteen: Thermodynamics

Required Materials


Grading

This course consists of fifteen (15) instructor-graded assignments and a final exam. Most assignments contain 5-6 problems to be completed mathematically, with some conceptual problems. The exam must be completed at a proctored location, with arrangements to be made by the student.

Instructor-Graded Assignments 40%
Final Exam 60%

In addition to earning the minimum number of points on assignments to receive a passing grade, students must earn at least a 60% on the final exam in order to receive a passing grade in the course.

This course is independent study and is self-paced. Students have five (5) months upon registration in which to complete all coursework, with an additional thirty (30) days allotted for completion of the final exam.

University Extension

For more information about University Extension courses and policies, please visit www.utextension.org. Questions may be directed to our office at (512) 471-2900 or uex@austin.utexas.edu. Office hours are M – F, 8 a.m. – 5 p.m. CST.