Course Outline: Physics (I)

Physics (I) is a foundational course designed for first-year mechanical engineering students. This course provides an introduction to the fundamental principles of physics and their applications in mechanical engineering. The course covers topics such as mechanics, thermodynamics, waves, and optics. Students will learn about the laws of motion, forces, energy, and momentum, and how they apply to mechanical systems. They will also study the behavior of gases, liquids, and solids, and the principles of heat transfer. The course will also cover the properties of waves, including sound and light, and their applications in engineering. Throughout the course, students will engage in hands-on activities and experiments to reinforce their understanding of the concepts covered. They will also develop problem-solving skills through the application of physics principles to real-world engineering problems. Upon completion of this course, students will have a solid foundation in physics and be able to apply their knowledge to the design and analysis of mechanical systems. They will also be prepared for further study in advanced physics courses and their applications in mechanical engineering.

Instructor Name: Jun Albert Pardillo  
Credit Units: 3  
Target Students: 1st Year Mechanical Engineering Students  
Total Hours: 54  
Class Hours per Week: 3

# Module 1: Mechanics

Hours: 12

Weeks: 1-4

This module covers the fundamentals of mechanics, including the laws of motion, force, and energy. Topics include Newton's laws, work and energy, conservation of momentum, and applications to mechanical systems.

# Module 2: Thermodynamics

Hours: 12

Weeks: 5-8

Introduction to the principles of thermodynamics including the concepts of heat, work, and energy. Study of the first and second laws of thermodynamics, and their applications in mechanical engineering systems like engines and refrigerators.

# Module 3: Fluid Mechanics

Hours: 10

Weeks: 9-11

Exploration of the behavior of fluids at rest and in motion. Topics include fluid statics, fluid dynamics, Bernoulli's equation, and the applications of fluid mechanics in engineering systems such as piping and pumps.

# Module 4: Waves and Optics

Hours: 10

Weeks: 12-14

This module delves into the properties of waves, sound, and light. It covers topics such as wave mechanics, acoustics, light propagation, reflection, refraction, and optical instruments.

# Module 5: Hands-on and Practical Applications

Hours: 10

Weeks: 15-18

Hands-on activities and experiments designed to reinforce the understanding of physics concepts. Problem-solving sessions focused on applying physics principles to real-world engineering problems.