

SYLLABUS  
PART I  
EDISON COMMUNITY COLLEGE  
PHY 121S COLLEGE PHYSICS I  
5 CREDIT HOURS

**COURSE DESCRIPTION**

Introductory algebra and trigonometry-based course in mechanics and thermal physics. Concepts of force, torque, energy, momentum, and equilibrium are introduced and used as a basis for solving problems, predicting the behavior of objects and systems, and explaining the ways nature works. Includes four hours of lecture and two hours of lab each week. Prerequisite: MTH 123S or MTH 128S. Lab fee.

**COURSE GOALS**

The student will:

Bloom's Level		Gen Ed Outcomes
2	1. Distinguish between velocity and acceleration.	1, 2
3	2. Determine the velocity and acceleration for a body from a distance-time graph.	1, 2
4	3. Correctly breakdown up to three vectors using graphical and analytical techniques.	1, 2
2	4. State Newton's three laws and cite examples relevant to each.	1, 2, 6
3	5. Correctly apply Newton's laws.	1, 6
3	6. Use conservation of linear and angular momentum as a tool to solve problems.	1, 3
3	7. Apply the conditions of equilibrium to static conditions.	1, 3
3	8. Correctly apply Newton's laws to situations involving friction.	1, 3, 6
3	9. Relate work and energy to practical situations.	1, 3, 6
3	10. Use conservation of energy as a tool for solving problems.	1, 3
3	11. Apply Pascal's Principle and Archimedes' Principle to static fluids.	1, 3
3	12. Use Bernoulli's Principle and the Continuity Equation to solve Fluid Dynamics problems.	1, 3
3	13. Use and relate various temperature scales.	1, 2, 3
3	14. Calculate thermal expansion for various materials.	1, 2, 3
3	15. Compute specific heats and heat transfer rates.	1, 3
3	16. Solve thermal equilibrium problems.	1, 3, 6
3	17. Apply Boyle's Law, Charles' Law, and the Ideal Gas Law to confined gases.	1, 3, 6
2	18. Describe gas dynamics at the micro and macro levels.	1, 2, 3
2	19. Describe the Laws of Thermodynamics.	1, 2
3	20. Use Hooke's Law and stress/strain relationships to solve elasticity problems.	1, 2, 3
3	21. Calculate the displacement, velocity, acceleration, frequency, and period for an object in simple harmonic motion.	1, 2, 3
2	22. Recognize sound waves as a type of simple harmonic motion.	1, 2, 6

**CORE VALUES**

The core values are a set of principles that guide in creating educational programs and environments at Edison. They include communication, ethics, critical thinking, human diversity, inquiry/respect for learning, and interpersonal skills/teamwork. The goals, objectives, and activities in this course will introduce/reinforce these Core Values whenever appropriate.

## TOPIC OUTLINE

1. Kinematics in One Dimension
2. Kinematics in Two Dimensions
3. Forces and Newton's Laws
4. Circular Motion
5. Work and Energy
6. Linear Momentum
7. Rotational Motion
8. Simple Harmonic Motion and Elasticity
9. Fluids
10. Temperature and Heat
11. Thermodynamics