

COLLEGEWIDE COURSE OUTLINE OF RECORD

PHYS 220 MECHANICS

COURSE TITLE: Mechanics
COURSE NUMBER: PHYS 220
PREREQUISITES: MATH 211 Calculus I
SCHOOL: Liberal Arts and Sciences
PROGRAM: Liberal Arts
CREDIT HOURS: 5
CONTACT HOURS: Lecture: 4 Lab: 2
DATE OF LAST REVISION: Fall, 2011
EFFECTIVE DATE OF THIS REVISION: Fall, 2015

CATALOG DESCRIPTION: A calculus based physics course that provides a detailed analysis of uniform and accelerated motion; Newton's laws; gravitation and planetary motion; energy; momentum; conservation principles; circular motion; angular momentum; dynamics of rotation; statics; hydrostatics and hydrodynamics; simple harmonic motion and wave motion. Includes lab.

MAJOR COURSE LEARNING OBJECTIVES: Upon successful completion of this course the student will be able to:

1. Use and convert physical quantities and measurements in the SI and USCS systems.
2. Correctly define vector and scalar quantities; compute vector components and resultants.
3. Analyze and calculate quantities for one and two dimensional motion.
4. Solve problems using Newton's three laws of motion.
5. Solve problems using Newton's law of gravity and describe planetary motion.
6. Describe and perform computations using the physical relationships of work and energy, momentum, angular momentum and conservation principles.
7. Perform computations in uniform circular motion, rotational dynamics, the motion of rigid bodies, and static equilibrium.
8. Solve problems using the elastic properties of matter and elastic moduli.
9. Solve problems in fluid mechanics.
10. Compute key parameters of periodic and simple harmonic motion.
11. Analyze and describe the properties of mechanical waves and sound.
12. Perform experiments to demonstrate scientific principles.
13. Recognize uncertainties in data and examine experimental error.
14. Draw reasonable conclusions from quantitative data and communicate results to others.

COURSE CONTENT: Topical area of study include –

Measurement and Units	Vectors
Kinematics in one and two dimensions	Newton's Laws of Motion
Gravitation and Planetary Motion	Work and Energy

Momentum and collisions
Dynamics of rotational motion
Static equilibrium
Fluid mechanics
Mechanical waves, wave Interference

Rotation of rigid bodies
Circular motion
Elasticity and Elastic Moduli
Periodic motion
Sound

LAB CONTENT: Laboratory experiments will be selected from the topics above.

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