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PHY241

University Physics I

Faculty Name: Yangsoo Kim

Program Head: Yangsoo Kim

Dean's Review:

Dean's Signature: _____ Date Reviewed: ___/___/___

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
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PHY241 University Physics I

COURSE OUTLINE

Pre and co-requisites:

MTH173 pre-requisite and MTH174 co-requisite.

Course Description:

Teaches principles of classical and modern physics. Includes mechanics, wave phenomena, heat, electricity, magnetism, relativity, and nuclear physics. Prerequisite for PHY 241--MTH 173 or MTH 273 or divisional approval. Prerequisite for PHY 242--MTH 174 or MTH 274 or divisional approval. Part I of II.
Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week. 4 credits

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Semester Credits: 4

Lecture Hours: 3

Lab/Recitation Hours: 3

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Course Objectives

At the completion of this course, the student should be able to:

1. Understand the equations of motion in one and two or three dimension and apply the equations of motion to predict the position and the velocity of an object from the initial condition.
2. Understand the Newton's laws of motion and many types of force and set up equations using Newton's 2nd law in order to find the acceleration of objects for linear and circular motion.
3. Understand work and kinetic & potential energy as well as conservation of energy and find the speed using conservation of energy.
4. Explain momentum, impulse and collisions.
5. Solve problems about dynamics of rotational motion by apply Newton's 2nd law in rotational form.
6. Understand and solve the problems regarding fluid mechanics, gravitation, and periodic motion.
7. Solve problems involving temperature & heat, thermal property of matter and ideal gas equation.

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8. Have the understanding of the first and second laws of thermodynamics and their application.

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Required Materials:

A calculator for exams and laboratory works

Textbook:

University Physics, Young and Freedman, 14th edition, Pearson (ISBN 9780321973610) with Mastering Physics

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Topical Description

Chapter 1	Units, physical Quantities, and Vectors
Chapter 2	Motion Along a Straight Line
Chapter 3	Motion in Two or Three Dimensions
Chapter 4	Newton's Laws of Motion
Chapter 5	Applying Newton's Laws
Chapter 6	Work and Kinetic Energy
Chapter 7	Potential Energy and Energy conservation
Chapter 8	Momentum, Impulse, and Collision
Chapter 9	Rotation of Rigid Bodies
Chapter 10	Dynamics of Rotational Motion
Chapter 11	Equilibrium
Chapter 12	Fluid Mechanics
Chapter 13	Gravitation
Chapter 14	Periodic Motion
Chapter 17	Temperature and Heat
Chapter 18	Thermal Properties of Matter

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Chapter 19 The First Law of Thermodynamics

Chapter 20 The Second Law of Thermodynamics

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Lab Schedule

- Lab 1 Introduction. Safety and Significant Figures. Fitting curves.
- Lab 2 Free Fall
- Lab 3 Projectile motion
- Lab 4 Addition of Force: Vector
- Lab 5 Static and Kinetic friction
- Lab 6 Newton's 2nd Law
- Lab 7 Energy conservation
- Lab 8 Ballistic pendulum
- Lab 9 Torque and Moment of Inertial
- Lab 10 Angular momentum conservation
- Lab 11 Hooke's Law and Simple Harmonic Motion
- Lab 12 Archimedes' Principle

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