

## **PH1012 Physics A\***

[Lectures: 39 hours (3 hours/week); Tutorial: 12 hours (1 hour/week); Pre-requisites: Basic trigonometry and calculus; Academic Unit: 4.0]

### **Learning Objective**

This course will encourage critical thinking by emphasizing on reasoning, understanding the relationship between concepts and seeing the relevance of physics to everyday life. It will teach strategies for problem solving that can be applied to real world situations. After the study, students will be equipped with the basic knowledge for further study in the broad field of engineering.

### **Content**

VECTORS. KINEMATICS. FORCES AND TORQUES. NEWTON'S LAWS OF MOTION. IMPULSE AND MOMENTUM. WORK AND ENERGY. THERMAL PHYSICS. ELECTRIC FIELD. MAGNETIC FIELD. MOTION OF CHARGED PARTICLES AND APPLICATIONS. CIRCUITS

### **Learning Outcome**

Upon successful completion of the course, students will be able to:

- Analyze the kinematics of a particle in order to predict its motion in standard 1-D and 2-D coordinate systems.
- Set up and solve vector equations for velocities and accelerations of simple motion of particles.
- Understand the concepts of forces and torques; Be able to solve equilibrium problems of rigid bodies.
- Understand the Newton's laws; Be able to solve motion problems using Newton's laws.
- Apply strategy for solving particle kinetic problems using the work and energy principle and the impulse and momentum principle.
- Understand basic thermodynamic laws and principles and use them for analysing simple engineering problems.
- Understand the basic concepts on topics related to electrical and magnetic fields, Ohm's Law, charged particle motion, and basic electrical circuit components.
- Undertake more advanced study in mechanical, electrical or civil engineering in the following semesters.

## **Textbooks/References**

Physics for Scientists and Engineers, 8th Edition  
R A Serway, J W Jewett Jr  
Brooks Cole

College Physics: A Strategic Approach  
Randall D. Knight, Brian Jones, Stuart Field  
Addison Wesley