UNIVERSITI TEKNOLOGI MARA

PHY011: PHYSICS FOR PRE DIPLOMA I

Course Name (English)	PHYSICS FOR PRE DIPLOMA I APPROVED
Course Code	PHY011
MQF Credit	3
Course Description	This course provides an introduction of the fundamental concepts in basic physics. Basic physics topics include measurements, vectors, kinematics, dynamics, energy and matters. Students will discuss concepts, laws and principles of the related topics in physics. They will also perform scientific investigation by displaying laboratory skills and produce written laboratory reports. This course is designed to help the pre-diploma students work through basic physics concepts that are needed for a diploma program.
Transferable Skills	Problem-solving, Critical thinking, Confident
Teaching Methodologies	Lectures, Lab Work, Tutorial, Discussion
CLO	CLO1 Apply the basic concept and principles related to physics. CLO2 Apply the concept of physics in solving quantitative problems related to calculation in physics. CLO3 Display the practical skills and technique in conducting the experiments and producing written reports related to basic physics.
Pre-Requisite Courses	No course recommendations

Topics
1. Measurements 1.1) 1.1 Basic quantities 1.2) 1.1.1 Definition 1.3) 1.1.2 Examples with base units (SI) 1.4) 1.2 Derived quantities 1.5) 1.2.1 Definition 1.6) 1.2.2 Examples 1.7) 1.3 Conversion of units 1.8) 1.3.1 Prefixes and scientific notation 1.9) 1.3.2 Techniques of unit conversion (between prefixes in SI system and between SI and other systems where conversion factor is provided) 1.10) 1.4 Measurement of length 1.11) 1.4.1 Instruments - metre ruler, vernier callipers, micrometre screw gauge 1.12) 1.4.2 Zero error
2. Kinematics 2.1) 2.1 Vectors and scalars 2.2) 2.1.1 Definitions 2.3) 2.1.2 Distance and displacement 2.4) 2.1.3 Speed and velocity 2.5) 2.1.4 Acceleration 2.6) 2.2 Graphs of linear motion 2.7) 2.2.1 Displacement - time graph, velocity-time graph, acceleration-time graph 2.8) 2.2.2 Gradient and area under the graph 2.9) 2.3 Equations of linear motion 2.10) 2.3.1 Motion with constant velocity 2.11) 2.3.2 Motion with constant acceleration 2.12) 2.3.3 Problem solving involving horizontal motion 2.13) 2.4 Understanding gravity 2.14) 2.4.1 Acceleration due to gravity 2.15) 2.4.2 Problem solving involving gravity

3. Dynamics
3.1) 3.1 Introduction: types of forces – definitions
3.2) 3.2 Newton's first law of motion
3.3) 3.2.1 Formal statement and examples
3.4) 3.2.2 Concepts of mass and inertia
3.5) 3.3 Newton's second law of motion
3.6) 3.3.1 Formal statement and examples
3.7) 3.3.2 Concepts of mass and weight
3.8) 3.3.3 Applications of force in compound system, one pulley system (no inclined plane)
3.9) 3.3.4 Frictional force on a horizontal plane (excluding coefficient of friction)
3.10) 3.4 Newton’s third law of motion
3.11) 3.4.1 Formal statement and examples
3.12) 3.5 Linear momentum and impulse
3.13) 3.5.1 Definitions and concepts
3.14) 3.6 Conservation of linear
3.15) 3.6.1 Formal statement
3.16) 3.6.2 Elastic, inelastic collisions and explosion
3.17) 3.6.3 Problem solving excluding simultaneous equations (one dimension)

4. Energy
4.1) 4.1 Work, energy and power
4.2) 4.1.1 Definitions and concepts
4.3) 4.1.2 Relationship between the three quantities
4.4) 4.1.3 Problem solving involving work, energy and power
4.5) 4.2 Kinetic energy and gravitational potential energy
4.6) 4.2.1 Kinetic energy
4.7) 4.2.2 Gravitational potential energy
4.8) 4.2.3 Work and energy theorem
4.9) 4.3 Principles of conservation of mechanical energy
4.10) 4.3.1 Problem solving involving conservation of mechanical energy

5. Matters
5.1) 5.1 Solid, liquid and gas
5.2) 5.1.1 Arrangement of particles in solid, liquid and gas
5.3) 5.2 Density
5.4) 5.2.1 Definition
5.5) 5.2.2 Relative density
5.6) 5.2.3 Problem solving excluding mixture
5.7) 5.3 Pressure
5.8) 5.3.1 Definition and concepts of pressure in liquid
5.9) 5.3.2 Application pressure in liquid
5.10) 5.3.3 Pascal's principle (statement and application)
5.11) 5.3.4 Problem solving involving pressure and Pascal’s principle
5.12) 5.4 Buoyancy in fluid
5.13) 5.4.1 Archimedes’ principle
5.14) 5.4.2 Problem solving involving buoyant force and Archimedes' principle

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	Individual based assignment related to solving quantitative problems in physics. This is to demonstrate the 'cognitive skills' (LOD2) in MQF2.0.	10%	CLO2
Test	Test related to the basic concept in physics. This is to emphasize the ' knowledge' (LOD1) in MQF 2.0.	30%	CLO1
Written Report	Written reports related to the basic concept of physics. This is to demonstrate the 'practical skills' (LOD3) in MQF2.0 .	20%	CLO3

Reading List

Recommended Text	• **Raymond A. Serway,Chris Vuille 2016, *College Physics*, 11 Ed., Cengage Learning [ISBN: 9781305952300]**
Reference Book Resources	• **David Halliday, Robert Resnick and Jearl Walker 2018, *Fundamentals of Physics: Extended, 11th Edition*, 11 Ed., John Wiley and Sons [ISBN: 9781119306856]** • **Raymond A. Serway,John W. Jewett 2018, *Physics for Scientists and Engineers*, 10 Ed., Cengage Learning [ISBN: 9781337553278]** • **Poh Liong Yong and Lee Beng Hin, *Physics for Matriculation Semester 1*, 5 Ed., Oxford Fajar [ISBN: 9789834725464]**
Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources