

PHY1202: GENERAL PHYSICS II

Effective Term

Semester A 2023/24

Part I Course Overview

Course Title

General Physics II

Subject Code

PHY - Physics

Course Number

1202

Academic Unit

Physics (PHY)

College/School

College of Science (SI)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

HKDSE Mathematics Compulsory Part or equivalent

Precursors

HKDSE Physics or Combined Science (Physics, Chemistry) or Combined Science (Biology, Physics) or AP1200/PHY1200 Foundation Physics or equivalent

Equivalent Courses

AP1202 General Physics II

Exclusive Courses

Nil

Part II Course Details

Abstract

This course covers a wide scope of topics in physics including electricity, magnetism and atomic physics. Students will investigate the fundamentals of these topics and become able to apply them to solve real problems in science and engineering. This course, together with PHY1101 Introductory Classical Mechanics or PHY1201 General Physics I, equip students with a broad knowledge in general physics and the depth and coverage are sufficient for the students to pursue most of the science and engineering majors.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 DEC-A2 DEC-A3 app.)			
1	Recognize and understand important technical terms and definitions in electricity and magnetism.	20	x		
2	A clear understanding on the formulation of the physical laws in electricity.	25		x	x
3	Using basic calculus and vector notation to obtain a clear understanding on the formulation of the physical laws and solve practical problems in magnetism.	25			x
4	Demonstrate a grasp of the laws in electricity and magnetism by solving real and hypothetical problems.	30		x	x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

TLAs	Brief Description	CILO No.	Hours/week (if applicable)	
1	Lectures	Lectures on (1) definition and properties of electric charges and electric fields; (2) derivation and applications of Gauss' s law and electric potential; (3) physical meaning of capacitance, current and resistance and their applications in simple DC circuits; (4) definition of magnetic field and current induced magnetic field; (5) Introduction of inductance.	1, 2, 3	26 hours

2	Tutorials	To provide students with practical training on solving selected end-of-chapter problems after each lecture.	4	10 hours, 18 hours homework
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Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks
1	Assignments Students will be continuously assessed on their understanding of the concepts of the lectures by the online assignments after each lecture.	1, 2, 3, 4	30	
2	Examination Students will be assessed via the examination on their understanding of concepts learned in class, textbooks, reading materials and their ability to apply subject-related knowledge.	1, 2, 3, 4		

Continuous Assessment (%)

30

Examination (%)

70

Examination Duration (Hours)

2

Additional Information for ATs

For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained

Assessment Rubrics (AR)**Assessment Task**

1. Assignments

Criterion

Ability to apply basic knowledge and important concepts of physics to explain in detail physical phenomena.

Excellent (A+, A, A-)

High

Able to correctly answer nearly all assignment questions.

Good (B+, B, B-)

Significant

Able to correctly answer most assignment questions.

Fair (C+, C, C-)

Moderate

Able to correctly answer some assignment questions.

Marginal (D)

Basic

Able to correctly answer a few assignment questions.

Failure (F)

Not even reaching marginal level

Unable to correctly answer even a few assignment questions.

Assessment Task

2. Examination

Criterion

Ability to apply basic knowledge and important concepts of physics for rationalization and to solve physics problems.

Excellent (A+, A, A-)

High

Able to correctly answer nearly all examination questions.

Good (B+, B, B-)

Significant

Able to correctly answer most examination questions.

Fair (C+, C, C-)

Moderate

Able to correctly answer some examination questions.

Marginal (D)

Basic

Able to correctly answer a few examination questions.

Failure (F)

Not even reaching marginal level

Unable to correctly answer even a few examination questions.

Part III Other Information

Keyword Syllabus

- Introduction to vectors and calculus.
- Electric fields: Coulomb's law. Field lines. Gauss law, dielectrics.
- Electric potential. Capacitors, capacitances, charge and voltages in capacitor.
- Conduction of electricity in solids. Resistance and resistivity, ohm's law, currents and voltage in DC circuit.
- Magnetism: Field due to magnets, moving charge and currents. Biot-savart Law, Force on a wire carrying a current in a uniform magnetic field. Lorentz force, force between parallel conductor, field of a circular current loop.
- Electromagnetic induction. Faraday's law. Lenz's law. Inductor and Inductance.

Reading List

Compulsory Readings

Title	
1	D Halliday, R Resnick, and J Walker, "Fundamentals of Physics" 9th Edition, Wiley (2005).

Additional Readings

Title	
1	R A Serway and J W Jewett, "Physics for Scientists and Engineers with Modern Physics" 6th Edition, Thomson - Brooks / Cole (2004).