# City University of Hong Kong
## Course Syllabus

### offered by Department of Physics
### with effect from Semester A 2020/2021

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**Part I**     **Course Overview**

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| **Course Title:** | **General Physics II** |
| **Course Code**: | **PHY1202** |
| **Course Duration:** | **One semester** |
| **Credit Units**: | **3** |
| **Level**: | **B1** |
| **Proposed Area:** <br> *(for GE courses only)* | ☐ Arts and Humanities <br> ☐ Study of Societies, Social and Business Organisations <br> ☐ Science and Technology |
| **Medium of Instruction:** | **English** |
| **Medium of Assessment:** | **English** |
| **Prerequisites**: <br> *(Course Code and Title)* | **HKDSE Mathematics Compulsory Part or equivalent** |
| **Precursors**: <br> *(Course Code and Title)* | **HKDSE Physics or** <br> **Combined Science (Physics, Chemistry) or** <br> **Combined Science (Biology, Physics) or** <br> **AP1200/PHY1200 Foundation Physics or equivalent** |
| **Equivalent Courses**: <br> *(Course Code and Title)* | **AP1202 General Physics II** |
| **Exclusive Courses**: <br> *(Course Code and Title)* | **Nil** |

## Part II    Course Details

### 1.    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.

### 2.    Course Intended Learning Outcomes (CILOs)
*(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)*

| No. | CILOs# | Weighting* (if applicable) | Discovery-enriched curriculum related learning outcomes (please tick where appropriate) | | |
|---|---|---|---|---|---|
| | | | *A1* | *A2* | *A3* |
| 1. | Recognize and use appropriately important technical terms and definitions relevant to the major topics in the course. | | √ | | |
| 2. | Use simple calculus and vector notation to formulate and apply the physical laws covered in the course in concise form. | | | √ | √ |
| 3. | Apply physics laws of electricity, magnetism and atomic physics in familiar situations. | | | | √ |
| 4. | Solve real and hypothetical problems by identifying the underlying physics and analyzing the problem. | | | √ | √ |

*\* If weighting is assigned to CILOs, they should add up to 100%.*   100%
*# Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.*

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.*

### 3.    Teaching and Learning Activities (TLAs)
*(TLAs designed to facilitate students' achievement of the CILOs.)*

| TLA | Brief Description | CILO No. | | | | | | Hours/week (if applicable) |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | | | |
| Lectures | Explaining the key concepts | √ | √ | √ | | | | 26 hours |
| Tutorials | Problem solving | | | | √ | | | 10hours, 18 hours homework |

## 4. Assessment Tasks/Activities (ATs)

*(ATs are designed to assess how well the students achieve the CILOs.)*

| Assessment Tasks/Activities | CILO No. | | | | | | Weighting* | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | | | | |
| Continuous Assessment: 30% | | | | | | | | |
| Assignments | √ | √ | √ | √ | | | 15% | |
| Tests | √ | √ | √ | √ | | | 15% | |
| | | | | | | | | |
| Examination^: 70% (duration: 2 hours) | | | | | | | | |
| Examination | √ | √ | √ | √ | | | 70% | |
| *The weightings should add up to 100%.* | | | | | | | 100% | |

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

**5.** **Assessment Rubrics**

*(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)*

| Assessment Task | Criterion | Excellent (A+, A, A-) | Good (B+, B, B-) | Fair (C+, C, C-) | Marginal (D) | Failure (F) |
|---|---|---|---|---|---|---|
| 1. Assignments | Understanding and explaining fundamental problem. Ability to identify new materials to solve such problems. Ability to explain prospects to solve the problem occurred. | High | Significant | Moderate | Basic | Not reaching marginal level |
| 2. Tests | Understanding and explaining fundamental problem. Ability to identify new materials to solve such problems. Ability to explain prospects to solve the problem occurred. | High | Significant | Moderate | Basic | Not reaching marginal level |
| 3. Examination | Explain the concept with problem solving ability. | High | Significant | Moderate | Basic | Not reaching marginal level |

**Part III   Other Information** (more details can be provided separately in the teaching plan)

**1.    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.

- AC circuits, voltage and currents in AC circuits.

**2.    Reading List**
**2.1  Compulsory Readings**
*(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)*

| 1. | D Halliday, R Resnick, and J Walker, "Fundamentals of Physics" 9th Edition, Wiley (2005). |
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**2.2  Additional Readings**
*(Additional references for students to learn to expand their knowledge about the subject.)*

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