

Subject Description Form

Subject Code	AP1D05
Subject Title	Introduction to Physics
Credit Value	3
Level	1
Pre-requisite/ Co-requisite/ Exclusion	<p>Exclusion:</p> <p>(1) AP10001 "Introduction to Physics "</p> <p>(2) Students with the following academic qualifications are not allowed to take the subject.</p> <p>(i) HKDSE: Level 3 or above in Physics as a single Science subject or a component of the Combined Science (sub-score)</p> <p>(ii) GCEAL: B Grade or above in Physics</p> <p>(iii) IB: 6 or above in Physics (HL)</p> <p>(iv) JEE: students who had attended the JEE Exam of Physics or Integrated Science</p> <p>(v) Others: will be considered by the subject lecturer case by case</p>
Objectives	<p>This is a subject designed for students with no background in physics studies. Fundamental concepts in major topics of physics (mechanics, heat, wave and electromagnetism) will be discussed. The aim of this subject is to equip students with some basic physics knowledge, and to appreciate its applications in various branches of science and technology.</p>
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <p>(a) solve simple problems in kinematics Newton's law and Energy;</p> <p>(b) solve problems in heat capacity and latent heat;</p> <p>(c) explain phenomena related to the wave character of light;</p> <p>(d) apply the superposition of waves;</p> <p>(e) understand electrostatic field and potential;</p> <p>(f) solve problems on interaction between current and magnetic field; and</p> <p>(g) describe and demonstrate the phenomenon of electromagnetism.</p>
Subject Synopsis/ Indicative Syllabus	<p>Mechanics: scalars and vectors; kinematics and dynamics; Newton's laws; momentum, impulse, work and energy; conservation of momentum and conservation of energy.</p> <p>Thermal physics: heat and internal energy; heat capacity; conduction, convection and radiation; latent heat.</p> <p>Waves: nature of waves; wave motion; reflection and refraction; image formation by mirrors and lenses; superposition of waves; standing waves; diffraction and interference; electromagnetic spectrum; sound waves.</p> <p>Electromagnetism: charges; Coulomb's law; electric field and potential; current and resistance; Ohm's law; magnetic field; magnetic force on moving charges and current-carrying conductors; Faraday's law and Lenz's law.</p>
Teaching/Learning Methodology	<p>Lecture: Fundamentals in mechanics, waves and electromagnetism will be explained. Examples will be used to illustrate the concepts and ideas in the lecture. Students are free to request help. Homework problem sets will be given.</p>

	<p>Student-centered Tutorial: Students will work on a set of problems in tutorials. Students are encouraged to solve problems and to use their own knowledge to verify their solutions before seeking assistance. These problem sets provide them opportunities to apply their knowledge gained from the lecture. They also help the students to consolidate what they have learned. Furthermore, students can develop a deeper understanding of the subject in relation to daily life phenomena or experience.</p> <p>e-learning: In order to enhance the effectiveness of teaching and learning processes, electronic means and multimedia technologies would be adopted for presentations of lectures; communication between students and lecturer; delivery of handouts, homework and notices etc.</p>																																																														
<p>Assessment Methods in Alignment with Intended Learning Outcomes</p>	<table border="1" data-bbox="443 618 1492 927"> <thead> <tr> <th data-bbox="443 618 850 734" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="850 618 1018 734" rowspan="2">% weighting</th> <th colspan="7" data-bbox="1018 618 1492 734">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="1018 734 1090 779">a</th> <th data-bbox="1090 734 1161 779">b</th> <th data-bbox="1161 734 1233 779">c</th> <th data-bbox="1233 734 1305 779">d</th> <th data-bbox="1305 734 1377 779">e</th> <th data-bbox="1377 734 1449 779">f</th> <th data-bbox="1449 734 1492 779">g</th> </tr> </thead> <tbody> <tr> <td data-bbox="443 779 850 831">(1) Continuous assessment</td> <td data-bbox="850 779 1018 831">40</td> <td data-bbox="1018 779 1090 831">✓</td> <td data-bbox="1090 779 1161 831">✓</td> <td data-bbox="1161 779 1233 831">✓</td> <td data-bbox="1233 779 1305 831">✓</td> <td data-bbox="1305 779 1377 831">✓</td> <td data-bbox="1377 779 1449 831">✓</td> <td data-bbox="1449 779 1492 831">✓</td> </tr> <tr> <td data-bbox="443 831 850 882">(2) Examination</td> <td data-bbox="850 831 1018 882">60</td> <td data-bbox="1018 831 1090 882">✓</td> <td data-bbox="1090 831 1161 882">✓</td> <td data-bbox="1161 831 1233 882">✓</td> <td data-bbox="1233 831 1305 882">✓</td> <td data-bbox="1305 831 1377 882">✓</td> <td data-bbox="1377 831 1449 882">✓</td> <td data-bbox="1449 831 1492 882">✓</td> </tr> <tr> <td data-bbox="443 882 850 927">Total</td> <td data-bbox="850 882 1018 927">100</td> <td colspan="7" data-bbox="1018 882 1492 927"></td> </tr> </tbody> </table> <p>Continuous assessment: The continuous assessment includes assignments, quizzes and test(s) which aim at checking the progress of students' study throughout the course, assisting them in fulfilling the learning outcomes. Assignments in general include end-of-chapter problems, which are used to reinforce and assess the concepts and skills acquired by the students; and to let them know the level of understanding that they are expected to reach. At least one test would be administered during the course of the subject as a means of timely checking of learning progress by referring to the intended outcomes, and as means of checking how effective the students digest and consolidate the materials taught in the class.</p> <p>Examination: This is a major assessment component of the subject. It would be a closed-book examination. Complicated formulas would be given to avoid rote memory, such that the emphasis of assessment would be put on testing the understanding, analysis and problem solving ability of the students.</p>									Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)							a	b	c	d	e	f	g	(1) Continuous assessment	40	✓	✓	✓	✓	✓	✓	✓	(2) Examination	60	✓	✓	✓	✓	✓	✓	✓	Total	100																		
Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)																																																													
		a	b	c	d	e	f	g																																																							
(1) Continuous assessment	40	✓	✓	✓	✓	✓	✓	✓																																																							
(2) Examination	60	✓	✓	✓	✓	✓	✓	✓																																																							
Total	100																																																														
<p>Student Study Effort Expected</p>	<table border="1" data-bbox="443 1552 1492 1937"> <tr> <td data-bbox="443 1552 1129 1608">Class contact:</td> <td colspan="8" data-bbox="1129 1552 1492 1608"></td> </tr> <tr> <td data-bbox="443 1608 1129 1675">• Lecture</td> <td colspan="8" data-bbox="1129 1608 1492 1675">33 h</td> </tr> <tr> <td data-bbox="443 1675 1129 1742">• Tutorial</td> <td colspan="8" data-bbox="1129 1675 1492 1742">6 h</td> </tr> <tr> <td data-bbox="443 1742 1129 1809">Other student study effort:</td> <td colspan="8" data-bbox="1129 1742 1492 1809"></td> </tr> <tr> <td data-bbox="443 1809 1129 1877">• Self-study</td> <td colspan="8" data-bbox="1129 1809 1492 1877">81 h</td> </tr> <tr> <td data-bbox="443 1877 1129 1937">Total student study effort</td> <td colspan="8" data-bbox="1129 1877 1492 1937">120 h</td> </tr> </table>									Class contact:									• Lecture	33 h								• Tutorial	6 h								Other student study effort:									• Self-study	81 h								Total student study effort	120 h							
Class contact:																																																															
• Lecture	33 h																																																														
• Tutorial	6 h																																																														
Other student study effort:																																																															
• Self-study	81 h																																																														
Total student study effort	120 h																																																														

Reading List and References	<p>John D. Cutnell & Kenneth W. Johnson, Introduction to Physics, 9th edition, 2013, John Wiley & Sons.</p> <p>Hewitt, Conceptual Physics, 11th edition, 2010, Benjamin Cummings.</p> <p>Radi, Hafez A., and John O. Rasmussen. Principles of Physics for Scientists and Engineers. Berlin ; New York: Springer, 2013. Undergraduate Lecture Notes in Physics. Web.</p>
------------------------------------	--