

Subject Description Form

Subject Code	AP00003
Subject Title	Foundation Physics II
Credit Value	3
Level	0
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	To provide students with fundamental knowledge in physics focusing on the topics of waves and electromagnetism.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ul style="list-style-type: none"> (a) grasp a basic understanding in selected fundamental physical principles in waves and electromagnetism; (b) solve real-life problems based on the physical principles; and (c) appreciate the importance of some physical principles as employed in various branches of engineering.
Subject Synopsis/ Indicative Syllabus	<p>Waves: nature of waves; wave motion and propagation; longitudinal and transverse waves; reflection and refraction; superposition of waves; standing waves; diffraction and interference; sound waves; light in electromagnetic spectrum; reflection and refraction of light; total internal reflection; image formation by mirrors and lenses; wave nature of light.</p> <p>Electromagnetism: electric charges; electric field and potential; current, potential difference and resistance; Ohm's law; series and parallel circuits; electrical power; magnetic force and magnetic field; magnetic effect of electric current; magnetic force on moving charges and current-carrying conductors; Hall effect; electromagnetic induction.</p>
Teaching/Learning Methodology	<p>Lecture: The fundamentals in waves and electromagnetism will be explained. Examples will be used to illustrate the concepts and ideas in the lecture. The students are free to request help. Homework problem sets will be given. The students are encouraged to solve problems and to use their own knowledge to verify their solutions before seeking assistance.</p> <p>Student-centered Tutorial: Students work on a set of problems in the tutorials. Students are encouraged to try to solve problems before seeking assistance. These problem sets provide them opportunities to apply the knowledge gained from the lecture. They also help the students consolidate what they have learned. Furthermore, students can develop a deeper understanding of the subject in relation to engineering science.</p>

Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)		
			a	b	c
	(1) Continuous assessment	40	✓	✓	✓
	(2) Examination	60	✓	✓	✓
	Total	100			
	<p>Homework problem sets and tests (assessment method 1) and a final written examination (assessment method 2) all require demonstration of basic understanding of the relevant physics (a), good problem solving skills (b), and being able to relate the fundamental physics to engineering problems (c).</p> <p>The continuous assessments aim at checking the progress of students study throughout the course, assisting them in self-monitoring of fulfilling the learning outcomes. The examination will be used to assess the knowledge acquired by the students; as well as to determine the degree of achieving the learning outcomes.</p>				
Student Study Effort Required	Class contact:				
	• Lecture		26 h		
	• Tutorial		13 h		
	Other student study effort:				
	• Self-study		81 h		
	Total student study effort		120 h		
Reading List and References	John D. Cutnell & Kenneth W. Johnson, Introduction to Physics , 9th edition, 2013, John Wiley & Sons.				
	Giambattista, Richardson and Richardson, Physics , 2nd edition, 2010, MaGraw-Hill.				