

Course Synopsis

Course Code	PHU3202	Level	3			
Course Title	Waves in Physics					
Credit value	2					
Core/Optional	Core					
Prerequisites	Pass in the relevant science subject at the G.C.E.(A.L.) Examination or equivalent					
Hourly breakdown	Theory hours		Practical hours	Independent Learning	Assessments	Total hrs
	Sessions x 2 = 18 x 2 hrs = 36 hrs	Dayschool hrs = 4 x 3 hrs = 12 hrs	Not Relevant	<ul style="list-style-type: none"> ▪ Sessions (18 x 3 hrs) = 54 hrs (Online /Audio-visual materials and other learning resources) ▪ Group Learning = 4 hrs 	<ul style="list-style-type: none"> ▪ Continuous Assessments (CA) = 2 hrs 	108 hrs
Course Aim/s.	Students who follow this course should be able to master a broad set of knowledge concerning the fundamentals in basic physics (Oscillations and Vibrations, Sound waves, Electromagnetic waves) and get the aptitude to use the knowledge that can be applied in many different ways to understand and predict what nature does.					
POs addressed by course	<p>PO1: Knowledge - Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the BSc degree.</p> <p>PO3: Communication - Communicate reliably, efficiently and effectively to present information, ideas and concepts to the scientific community as well as to the wider society.</p> <p>PO4: Individual Work, Team Work and Leadership - Function effectively as an individual, and as a team member, sharing work and experiences, leading and managing assigned tasks to completion on time, demonstrating leadership to address situations in diverse and multi-disciplinary environments in day to day life.</p> <p>PO5: Creativity and Problem Solving - Identify problems and argue out and analyze such problems using qualitative and/or quantitative practical approaches in scientific methodology to provide valid conclusions.</p> <p>PO6: Adaptability and Flexibility - Develop appropriate strategies to adapt to changing environments.</p> <p>PO7: Information and Communication Technology Literate: Effectively use ICT skills for numerical and statistical analysis keeping up to date with knowledge and skills.</p> <p>PO8: Vision for Life: Identify where one wants to be and develop long term goals maintaining competency to conduct scientific investigations and proceed to undertake further studies.</p> <p>PO9: Lifelong Learning: Foresee new trends and recognize their impact, and update knowledge and develop new skills to meet future changes and challenges.</p>					
Course Learning Outcomes (CLO)	<p>Students following this course should be able to:</p> <p>CLO1: Comprehend the basic concepts and principles in Oscillations and Vibrations, Sound waves, Electromagnetic waves, and appreciate how they are applied in our day-to-day life. (PLO1, PLO6)</p> <p>CLO2: Develop competency in acquiring new knowledge and applying it in a variety of situations.(PLO1,PLO8,PLO9)</p> <p>CLO3: Apply basic mathematical tools commonly used, such as differential and integral calculus, vector calculus, ordinary differential equations, and linear algebra. (PLO5)</p> <p>CLO4: Develop the ability to clearly express their thinking in both oral and written form, and efficiently acquire new information from many sources. (PLO3, PLO4, PLO5, PLO8, PLO9)</p> <p>CLO5: Convert a physical situation articulated in English/Sinhala/Tamil language to a mathematical formulation and then analyse it quantitatively. (PLO5, PLO7, PLO9)</p> <p>CLO6: Solve problems, through critical thinking and analytical skills, by identifying the essential parts of a problem and formulating a strategy for solving the problem. Estimate the numerical solution to a problem. Apply appropriate techniques to arrive at a solution, test the correctness of the solution, and interpret the results. (PLO5, PLO6, POL7, PLO9)</p> <p>CLO7: Communicate the concepts, principles and the results of problems using effective scientific writing and communication skills.(PLO3, PLO4, PLO8, PLO9)</p>					
Content (Main topics, sub topics)	<p>Oscillations and Vibrations: Simple harmonic motion, superposition of simple harmonic motion, damped oscillations, forced oscillations and resonance, waves in physical media; Sound waves: Properties of sound waves, interference of sound waves, intensity and sound level, interaction of sound waves and acoustics, ultrasonic waves; Electromagnetic waves: Introduction to EM waves, production of EM waves and their uses, wave equation and wave properties, basic modes of propagation of EM waves, reflection, transmission, diffraction, interference and polarization of EM waves.</p>					
Teaching Learning methods (TL)	<ul style="list-style-type: none"> • Self-Learning/Independent learning of Self-study <ul style="list-style-type: none"> • Instructional Material (IL) • Online Activities (OL) • Reference Work (RE) • Compulsory contact sessions <ul style="list-style-type: none"> • Assessments (AS) and Feedback – MCQs (MCQ);Structured Essay (SEQ); • Non-compulsory contact sessions <ul style="list-style-type: none"> • Day Schools (DS) • Group Learning (GL) 					

Assessment strategy	Overall Continuous Assessment Mark (OCAM): 40 %	Final Assessment: 60 %
	Details: Continuous Assessment (CA): OCAM = 60% of Best NBT + 40% of other NBT (2 hrs)	Final Evaluation Theory: 100 % (2 hrs)
Recommended Readings:	[1] David Halliday, Robert Resnick, Jearl Walker; (2013); <i>Fundamentals of Physics (10th ed.)</i> ; John Wiley & Sons [2] Lawrence E. Kinsler; (1982); <i>Fundamentals of acoustics</i> ; John Wiley & Sons [3] A.P French; (1991), <i>Vibrations and Waves</i> ; Norton company [4] H. J. Pain; (2006); <i>The Physics of Vibrations and Waves (6th Ed.)</i> ; John Wiley & Sons [5] Carlo G. Somenzi; (2006); <i>Electromagnetic Waves (2nd Ed)</i> ; CRC Press	