

Guidelines for preparation of Course Synopses:

Course Synopsis Course Code	PHU3301 Level 03					
Course Title	Basic electromagnetism					
Credit value	03					
Core/Optional	Core					
Prerequisites	Pass in GCE A/L or OUSL Foundation certificate / Foundation courses in Physics					
Hourly breakdown	Theory		Practical hours	Independent Learning	Assessments	Total hrs
	40 hrs (20 sessions) 2 x 20 hrs	12 hrs (4 DS) 4 x 3 hrs	18 hrs (3 days Lab) 3 x 6 hrs	<ul style="list-style-type: none"> ▪ Sessions (20x 3)=60hrs ▪ Online /Audio-visual materials and other learning resources 6hr ▪ Lab other (x 0.5) ▪ Other = hrs 	<ul style="list-style-type: none"> ▪ Continuous Assessments (CA) 2 hrs ▪ Practical assessments (PA) 6x2=12 hrs ▪ Other = hrs 	
Course Aim/s.	<p>Students who follow this course should:</p> <ol style="list-style-type: none"> [1] Master a broad set of knowledge concerning the fundamentals in electricity and magnetism. [2] Get the aptitude to use the knowledge in fundamental concepts in electromagnetism that can be applied in many different ways to understand and predict what nature does. [3] Appreciate how observation and experiment along with theory work together to continue to expand the frontiers of knowledge of the physical universe. [4] Recognize the objective of the physics laboratory experiment and use the laboratory sessions to develop their creativity and scientific writing skills. [5] Be able to communicate ideas in physics with precision and clarity to both experts and non-experts 					
POs addressed by course	<p>students should be able to:</p> <p>PLO-01 Knowledge: Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the BSc degree.</p> <p>PLO-02 Problem Analysis: Identify problems and apply knowledge acquired, and analyze such problems using qualitative and/or quantitative practical approaches in scientific methodology to provide valid conclusions.</p> <p>PLO-03 Information and Communication Technology Literate: Effectively use ICT skills for numerical and statistical analysis keeping up to date with knowledge and skills.</p> <p>PLO-04 Individual and Team Work: Function effectively as an individual, and as a team member, sharing work and experiences, leading and managing assigned tasks to completion on time.</p> <p>PLO-05 Communication: Communicate effectively to present information, ideas and concepts to the scientific community as well as to the wider society whilst being able to comprehend, write effective reports and design documentation.</p> <p>PLO-06 Lifelong Learning: Foresee new trends and recognize their impact, and have the knowledge and ability to engage in independent and lifelong learning to meet future change and challenges.</p> <p>PLO-07 Project Management and Leadership: Demonstrate scientific and management leadership to address situations in diverse and multi-disciplinary environments in day to day life.</p> <p>PLO-08 Vision for Life: Identify where one wants to be and develop long term goals maintaining the ability to conduct scientific investigations and proceed to undertake research studies at higher levels.</p>					
Course Learning Outcomes (CLO)	<p>Students following this course should be able to:</p> <p>CLO-01 Comprehend the basic concepts and principles in Electrostatic, Electricity and magnetism, and appreciate how they are applied in science in our day-to-day life. (PLO-01 and PLO-06)</p> <p>CLO-02 Develop competency in acquiring new knowledge and applying it in a variety of situations. (PLO-01 and PLO-08)</p> <p>CLO-03 Apply basic mathematical tools commonly used in physics, including differential and integral calculus, vector calculus, ordinary differential equations, and linear algebra. (PLO-02)</p> <p>CLO-04 Develop the ability to clearly express their thinking in both oral and written form, and efficiently acquire new information from many sources. (PLO-03, PLO-05 and PLO-08)</p> <p>CLO-05 Convert a physical situation articulated in English/Sinhala/Tamil language to a mathematical formulation and then analyse it quantitatively. (PLO-02 and PLO-03)</p> <p>CLO-06 Solve problems competently 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. (PLO-02 and POL3)</p> <p>CLO-07 Develop critical thinking, analytical skills, report writing skills and skills needed in a laboratory. (PLO-01, PLO-05 and PLO-07)</p> <p>CLO-08 Students should be able to handle the basic laboratory equipment and understand the standard methods of conducting physics experiments. (PLO-01 and PLO-04)</p>					

	<p>CLO-09 Use basic laboratory data analysis techniques, including error and statistical analysis, and develop skills in reporting and interpreting data graphically.(PLO-02 and PLO-04)</p> <p>CLO-10 Communicate the concepts, principles and the results of their laboratory experiments using effective scientific writing and oral communication skills.(PLO-05 and PLO-08)</p>	
Content (Main topics, sub topics)	<p>1.0 Static Electricity</p> <p>Electric charge and Coulomb's Law; electric field and lines of force; electric flux and Gauss' Theorem; electric potential; dielectrics; capacitors (8 sessions)</p> <p>2.0 Current Electricity</p> <p>current electricity and Ohm's Law; electrical circuits and Kirchoff's Laws; magnetic action of moving charges; force on moving charges in a magnetic field; moving coil galvanometers; electromagnetic induction; Inductance; transformers; magnetic properties of materials; transient phenomena and AC theory. (10 Sessions)</p> <p>Practicals (3 days)</p>	
Teaching Learning methods (TL)	<ul style="list-style-type: none"> • Independent/Group learning: Course material in print (20 Sessions), Practical Guide book, Online components, Recommended readings • Compulsory contact sessions: Laboratory classes - 3 days x 6hrs • Non-compulsory contact sessions: 4 Day schools • Continuous assessments: 2 NBT + Practical Assessment 	
Assessment strategy	Overall Continuous Assessment Mark (OCAM): 40%	Final Assessment: 60%
	Details: Continuous Assessment (CA) 60 % Practical Assessment (PA) 40% Continuous Assessment (CA) :(Best NBTx36% + other NBTx24%) EL Criterion – CAM ≥ 35%	Theory paper (2 hours) 4 to be answered out of 6 essay type questions. Final Examination Marks: 100% Final Evaluation Theory: 100%
	Overall Mark = OCAM x 40 % + Final Examination x 60 %	
Recommended Readings:	<ul style="list-style-type: none"> • Fundamentals of Physics by Halliday, Resnick and Walker 8th /9th/10th Edition 	