

Module code	SP-1205		
Module Title	Experimental and Mathematical Skills in Physics		
Degree/Diploma	Bachelor of Science (Applied Physics)		
Type of Module	Major Core		
Modular Credits	4	Total student Workload	10 hours/week
		Contact hours	6 hours/week
Prerequisite	A Level Physics or equivalent		
Anti-requisite	SP-1201 Basic Experimental Skills in Physics		
Aims			
To expose students to the basic laboratory skills and methods of data analysis as well as the mathematical skills in physics.			
Learning Outcomes			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order :	10%	<ul style="list-style-type: none"> - Identify the basic laboratory skills and data analysis in experimental physics - Describe the various mathematical concepts that are used in physics 	
Middle order :	10%	<ul style="list-style-type: none"> - Explain the usage and purpose of various electronic components, and other laboratory tools and equipments, for experiments - Apply knowledge on various electronic components and other laboratory tools and equipments - Formulate and solve various physics problems mathematically 	
Higher order:	80%	<ul style="list-style-type: none"> - Evaluate data and results from various experimental exercises and apply graph plotting tools for data treatments - Analyse and interpret the results from experimental exercises that includes uncertainties analysis - Work independently and collaboratively in experimental works 	
Module Content:			
<ul style="list-style-type: none"> - Basic electronics, identification of electronic components, use of digital multimeters - Connection of basic electrical components, Soldering and familiarization with common tools - Principles of vernier callipers - Use of computers for graph-plotting and data treatment - Analysis of uncertainties in measurements, study of optical components - Use of the traditional cathode-ray-tube and the modern computer oscilloscopes - Trigonometric and hyperbolic functions, complex numbers, calculus - Series expansions, limits and convergence, three-dimensional trigonometry - Solution of linear ordinary and partial differential equations - Vectors, div, grad and curl, Divergence theorem and Stokes' theorem, - Fourier series and transforms - Matrices, eigenvalues and eigenvectors, Convolution theorem, Probability distributions 			
Assessment	Formative assessment	Weekly Tutorials Sessions and Discussion	
	Summative assessment	Examination: 0% Coursework: 100% <ul style="list-style-type: none"> - 3 Individual Lab Reports (30%) - 1 Log Book Assessment (30%) - 1 Individual Practical Lab Skills Assessment (10%) - 2 Class Tests (30%) 	