Module code	SP-2307			
Module Title	Introduction to Computational Physics			
Degree/Diploma	Bachelor of Science (Applied Physics)			
Type of Module	Major Option			
Modular Credits	4	**Total student Workload**	10	hours/week
		Contact hours	4	hours/week
Prerequisite	None			
Anti-requisite	None			

Aims

This module aims to introduce students to the use of numerical methods and scientific software to perform calculations and simulations in experimental and theoretical physics.

Learning Outcomes

On successful completion of this module, a student will be expected to be able to:

Lower order :	0%	None
Middle order :	30%	- discuss the basic features of numerical routines and various evaluation methods used in physics computation and simulations.
Higher order:	70%	- perform and explain the rationales behind various techniques of data analysis and curve fitting. - convert physics problems into calculation routines for numerical evaluation. - perform Monte Carlo simulations of physics problems.

Module Contents

 - Basics of numerical methods in physics
 - choices of language and software
 - simple numerical routines in physics
 - precision and round-off error
 - projectile motion
 - simple pendulum motion
 - Kepler's problem
 - Runge-Kutta method
 - solving non-linear problems
 - traffic flow
 - analysis of data
 - curve fitting
 - principles of Monte Carlo simulations.

Assessment	Formative assessment	In-class questions and feedback
	Summative assessment	Examination: 0%
		Coursework: 100% 5 pieces of work which may include projects, problem solving, reports, tests, and assignments.