Module code	SM-4313			
Module Title	Mechanics			
Degree/Diploma	Bachelor of Science (Mathematics)			
Type of Module	Major Option			
Modular Credits	4	**Total student Workload**	10	hours/week
		Contact hours	4	hours/week
Prerequisite	SM-2201 Ordinary Differential Equations			
Anti-requisite	None			

Aims

This module is intended to introduce students to the mathematical principles underlying the stability or motion of systems of particles or rigid bodies in Newtonian physics, to the more general kinematics of special relativity, and to the more advanced theoretical formulations of Lagrangian and Hamiltonian mechanics.

Learning Outcomes

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

Lower order :	40%	- understand the basic principles of mechanics
Middle order :	40%	- analyse various problems in mechanics
Higher order:	20%	- interpret the results of analyses
		- work independently and in a team

Module Contents

- - Addition of forces. Newton's laws of motion.

- Velocity and acceleration in polar coordinates. Conservation principles.

- Variable mass problems. Motion of systems of particles and rigid bodies.

- Relativistic kinematics.

- Principle of least action.

- Conjugate momenta, Hamiltonian function and Hamilton's canonical equations of motion.

Assessment	Formative assessment	Tutorial and feedback.
	Summative assessment	Examination: 60%
		Coursework: 40% - 4 tests (40%)