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| 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 | | | |
| <i>On successful completion of this module, a student will be expected to be able to:</i> | | | |
| 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 | | | |
| <ul style="list-style-type: none"> - 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%) | |