

Faculty	Natural Sciences		
Home Department	Physics and Astronomy		
Module Topic	Classical Mechanics and Electrodynamics		
Generic Module Name	Physics 222		
Alpha-numeric Code	PHY222		
NQF Level	6		
NQF Credit Value	20		
Duration	Semester		
Proposed semester to be offered.	Second Semester		
Programmes in which the module will be offered	BSc (Physical Science) (3233, 3120) BSc (Chemical Sciences) (3220, 3019) BSc (Computer Science) (3221, 3023) BSc (Mathematics and Statistical Sciences) (3227, 3031)		
Year level	2		
Main Outcomes	<p>On completion of this module students should be able to:</p> <ul style="list-style-type: none"> • Solve problems in Classical Mechanics and Electrodynamics. • Utilize mathematical and computer skills in problem solving. • Interpret and represent the basic subject matter, with emphasis on the unity of electric and magnetic phenomena. • Do experimental work related to topics in Classical Mechanics and Electrodynamics. • Write and interpret practical reports. 		
Main Content	<ul style="list-style-type: none"> • Newton's equation of motion, Conservation of energy and conservative forces. Velocity dependent non-conservative damping forces. Conservative systems in 3-D, Central force motion. Dynamics of many-body systems, Dynamics of rigid bodies. Non-inertial reference frames. • Electrostatics: The electrostatic Field, Divergence and Curl of electrostatic fields, Electric Potential, work and energy in electrostatics, Conductors. • 325 • Magnostatics: The Lorenz Force, Biot-Savart Law, Divergence and Curl of magnostatic Fields, Vector Potential. • Electrodynamics: The emf, Faraday's Law, Maxwell's Equations. • Electromagnetic waves: The Wave equation. 		
Pre-requisite modules	(PHY111 and PHY121) or (PHY151 and PHY152) and (MAT105 or MAT103 or MAM152)		
Co-requisite modules	None		
Prohibited module Combination	None except from timetable clash groups		
Breakdown of Learning Time	Hours	Time-table Requirement per week	Other teaching modes that does not require time-table
<i>Contact with lecturer / tutor:</i>	42	Lectures p.w.	3
<i>Assignments & tasks:</i>	14	Practicals p.w.	3
<i>Practicals:</i>	56	Tutorials p.w.	1
<i>Assessments</i>	6		
<i>Selfstudy</i>	68		

<i>Other: Tutorials</i>	14			
Total Learning Time	150			
Method of Student Assessment	Continuous Assessment (CA): 60% Final Assessment (FA): 40%			
Assessment Module type	Continuous and Final Assessment (CFA)			