Module code	SP-4301			
Module Title	Characterization and Evaluation of Materials			
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 engage students to develop practical and analytical skills in the principal techniques for materials characterization.

Learning Outcomes

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

Lower order :	0%	None
Middle order :	30%	- explain and interpret microstructures and their relationship with properties - choose methods for the evaluation of materials for specific applications
Higher order:	70%	- perform tests for the suitability of materials for given applications - explain and apply test data from materials evaluation - interpret and apply materials specification data - work independently and also collaboratively in a team - interpret the results of analyses, and make appropriate reports and presentations for effective communication

Module Contents

- Material properties and how these determine material choice for specific applications
- Concepts of atomic, chemical, and micro- structures
- Structure–property relationships
- Overview of many techniques in mechanical, thermal, microstructural, surface, and non-destructive characterization, including: thermal analysis, X-ray methods, optical microscopy, scanning electron microscopy, electron probe micro-analysis, tensile tests, 3-point bend tests, micro-hardness, NMR, NDT, optical spectroscopy, and impedance spectroscopy.
- Practical demonstration of NDT, optical spectroscopy, and impedance spectroscopy.

Assessment	Formative assessment	In-class questions and feedback
	Summative assessment	Examination: 0%
		Coursework: 100% - 2 class tests (30%) - 5 laboratory reports (50%) - 1 project (20%)