

<b>Module code</b>	SP-2305		
<b>Module Title</b>	Introduction to Materials Science		
<b>Degree/Diploma</b>	Bachelor of Science (Applied Physics)		
<b>Type of Module</b>	Major Option		
<b>Modular Credits</b>	4	<b>Total student Workload</b>	10 hours/week
		<b>Contact hours</b>	4 hours/week
<b>Prerequisite</b>	None		
<b>Anti-requisite</b>	None		
<b>Aims</b>			
This module aims to introduce the concepts and principles involved in the science and engineering of materials in everyday use.			
<b>Learning Outcomes</b>			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order :	50%	<ul style="list-style-type: none"> <li>- be able to classify materials into specific groups</li> <li>- explain the physical and functional properties of materials from atomic scale</li> <li>- explain microstructure and property relationship in materials</li> <li>- explain mechanical indices for characterizing materials</li> <li>- explain principles of strengthening mechanism in engineered materials</li> </ul>	
Middle order :	40%	<ul style="list-style-type: none"> <li>- evaluate the functional requirements for materials in specific applications</li> <li>- evaluate and characterize the failure of materials</li> </ul>	
Higher order:	10%	<ul style="list-style-type: none"> <li>- write appropriate reports for effective communication while working independently and also collaboratively in a team</li> </ul>	
<b>Module Contents</b>			
<ul style="list-style-type: none"> <li>- Introduction to materials in modern devices</li> <li>- Classification of materials into groups (metals, ceramics, and polymers)</li> <li>- Atomistic and particulate nature of materials</li> <li>- Concepts of crystalline and non-crystalline solids</li> <li>- Electronic/atomic models and structures</li> <li>- Relationship between inter or intra-particulate association and optical, electrical, magnetic, and thermal properties</li> <li>- Crystalline defects and their effects on properties</li> <li>- Principles of diffusion and diffusive processes in phase changes and materials processing</li> <li>- Principles of strengthening mechanisms</li> </ul>			
<b>Assessment</b>	Formative assessment	In-class questions, tutorials and feedback	
	Summative assessment	Examination: 60% Coursework: 40% <ul style="list-style-type: none"> <li>- 2 class tests (20%)</li> <li>- 2 assignments (20%)</li> </ul>	