

DMX3203 Introduction to Engineering Materials

Level	3
Course Code	DMX3203
Course Title	Introduction to Engineering Materials
Credit value	2
Core/Optional	Core
Course Aim/s	The aim of this course is to provide basic principles of engineering materials and their applications.
Course Learning Outcomes (CLO):	<p>At the completion of this course student will be able to:</p> <p>CLO1: Demonstrate the knowledge of material science relevance to mechanical engineering applications.</p> <p>CLO2: Describe the structure of metals, polymers and ceramic materials.</p> <p>CLO3: Describe the relationship between the structure of a material and its properties.</p> <p>CLO4: Determine the mechanical properties of different engineering materials by experimental methods.</p> <p>CLO5: Discuss the behaviour of materials and strengthening mechanisms.</p> <p>CLO6: Describe the physical properties of engineering materials.</p>
Content	<p>Outline Syllabus:</p> <p>Unit 1:</p> <p style="padding-left: 20px;">Session 01: Introduction to Materials Science in Engineering Session 02: Overview of Engineering Materials Session 03: Atomic Structure and Bonding Mechanisms of Materials Session 04: Structure of Solid Materials Session 05: Crystalline Imperfections Session 06: Diffusion in Solids Session 07: Solidification and Phase Transformation Session 08: Phase Diagrams Session 09: Mechanical Properties of Engineering Materials Session 10: Behaviour of Engineering Materials under Mechanical Stresses Session 11: Strengthening and Softening Mechanisms of Engineering Materials</p> <p>Unit 2:</p> <p style="padding-left: 20px;">Session 12: Types, Processing and Applications of Engineering Materials Session 13: Degradation of Engineering Materials Session 14: Thermal Properties of Engineering Materials Session 15: Electrical and Electronic Properties of Engineering Materials Session 16: Magnetic Properties of Engineering Materials Session 17: Introduction to Nano-materials (Online)</p> <p>Laboratory work:</p> <ol style="list-style-type: none"> 1. Comparison of mechanical properties of different materials 2. Measurement of hardness of materials 3. Measurement of hardness variation with different types of heat treatment