

DMX5204 Materials Engineering

Level	5
Course Code	DMX5204
Course Title	Materials Engineering
Credit value	2
Core/Optional	Core
Course Aim/s	Aim of this course is to provide principles of materials engineering and their applications.
Course Learning Outcomes (CLO):	<p>At the completion of this course student will be able to :</p> <p>CLO1: Determine the microstructure of alloys using phase diagrams</p> <p>CLO2: Explain variation of microstructure using isothermal transformation diagrams at different cooling rates</p> <p>CLO3: Determine type of failure and failure mechanism with the aid of fracture surface</p> <p>CLO4: Explain the applications and processing methods of ceramics, polymers and composites with the knowledge of their properties</p> <p>CLO5: Analyze the properties, cost and availability of various types of materials and select suitable materials for a given component.</p>
Content	<p>Outline Syllabus:</p> <p>Unit 1:</p> <ul style="list-style-type: none"> Session 1: Multiphase materials Session 2: Binary systems Session 3: Iron - Carbon system and its applications Session 4: Phase diagrams of Inter-metallic compounds Session 5: Strengthening of Materials Session 6: Isothermal Transformation and Hardenability Session 7: Stainless steels and their applications Session 8: Dislocations and slip (yield) phenomenon <p>Unit 2:</p> <ul style="list-style-type: none"> Session 9: Fatigue, Creep and Ductile to Brittle Transition Session 10: Brittle fracture Session 11: Ceramics -I Session 12: Ceramics – II Session 13: Polymers - 1 Session 14: Polymers - II Session 15: Composite materials Session 16: Selection of materials <p>Laboratory work</p> <ol style="list-style-type: none"> 1. Determination of Ductile-Brittle Transition Temperature using impact test 2. Preparation of material samples for microstructure observation 3. Microstructure observation for various materials