

Module Title:	Processes & Materials 1
Academic year:	2008 – 2009
Credit Value:	5 – Mandatory
Pre- requisites:	
Assessment:	50% Final Exam, 30% Practical, 20% Project.
Aims	<ol style="list-style-type: none"> 1. To provide the student with fundamental knowledge in materials and manufacturing processes for both metals and plastics. 2. To provide the student with an overview of the relationship between the structure and properties of materials and their influences on manufacturing processes. 3. To provide the student with the knowledge required to implement both materials and manufacturing process selection through the analysis of design requirements. 4. To expand the student's knowledge of the environmental aspects of manufacturing processes.
Module Content	<ul style="list-style-type: none"> • Classification and Properties of Materials. • Structure of Metals. • Structure of Polymers. • Materials Testing: tensile testing, impact, hardness, fatigue. • Manufacturing Processes of Metals: basic bulk forming processes, casting processes machining processes. • Manufacturing Processes of Polymers: extrusion, Injection moulding, blow moulding. • Joining and Surface Treatments techniques

Intended Learning Outcomes:	On successful completion of this module the student will be expected to be able to: <ol style="list-style-type: none">1. Identify a material from its physical and mechanical properties.2. Explain how a material's properties are influenced by the manufacturing method.3. Describe the tensile testing of a material to determine the material's properties.4. Describe how metals can be shaped into a variety of forms used in industry; rolling, extrusion, casting, machining, and powder metallurgy.5. Describe how polymers can be shaped into a variety of forms using common manufacturing processes; blow moulding, injection moulding, extrusion.6. Identify the main joining methods that can be used for metals and polymers.7. Describe the major machining processes; turning, milling, drilling.8. Analyse the manufacturing process and materials of a product including concepts of clean manufacturing, reusing and recycling.9. Work as part of a team to complete a technical assignment with written and oral reporting.10. Describe the fatigue testing of materials to determine material properties.11. Describe the hardness testing of materials to determine the material's properties. Use hardness testing equipment.12. Describe the Impact testing of materials to determine the material's properties. Use an impact test machine.13. Explain how material structure influences manufacturing processing and the application of the material.
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