

<b>Course Code</b> : GP 113
<b>Course Title</b> : Fundamentals of Manufacture
<b>Credits</b> : 3
<b>Prerequisites</b> : -
<b>Core/ Elective</b> : Core
<b>Aims :</b> To provide fundamental knowledge on Manufacturing Engineering enabling students to evaluate, design and manufacture products satisfying organizational and consumer requirements and to select, perform and control manufacturing machines and use materials and equipment in a coordinated manner satisfying economies and standards.
<b>Learning Outcomes :</b> At the end of this course, students should be able to: <ul style="list-style-type: none"> <li>● Select the most appropriate processes and techniques to manufacture a given product based on the resources, production volumes, technology, and demand.</li> <li>● Adopt a systematic product development and manufacturing process for a defined product.</li> <li>● Adhere to health and safety requirements in a manufacturing workshop.</li> <li>● Use mechanics of metal removal process to select, modify machines, tools, and processes towards optimizing a machining process.</li> <li>● Define and develop processes and carry out basic design approaches related to manufacturing process such as forming, welding, carpentry, PCB manufacture, and casting to manufacture given products.</li> <li>● Use metrology as a tool for elevating and assuring quality and reliability in manufactured products and to use metrological instruments where necessary.</li> <li>● Select and develop basic layouts of a manufacturing facility, prepare a manufacturing schedule and carry out basic planning processes related manufacturing.</li> </ul>

No	Topic	Time Allocation/ hours			
		L	T	P	A
1	Introduction to Manufacturing Industry: Manufacturing Industry, Company Structures, Manufacturing relation to Design, Purchasing and Marketing Definition of Jobbing, Batch and Mass Production, Brief description on Modern Manufacturing Techniques such as CNC and CAD/CAM Materials used in Engineering Manufacture	03	01	02	

2	Introduction to Manufacturing Processes and Safety Measures: Introduction to conventional manufacturing processes and safety measures to be incorporated inside a machine shop, press shop, welding shop and foundry shop	01			
3	Machining: Introduction and classification of manufacturing processes, Single and multi-point cutting tools, Tool geometry and materials, Lathe, Milling and CNC operations.	08	03	16	
4	Casting and Other Processes: Sand casting, Centrifugal casting Other metal removal processes (Grinding, Shaping and planing) Introduction to Carpentry			04	
5	Welding and Metrology: Introduction to gas and arc welding Use of precision measuring instruments			04	
6	Metal Forming and Forging: Forming operations such as bending, drawing and forging, Introduction to mathematical analysis of the forming and forging processes	04	02		
7	Manufacturing Systems Planning issues in Manufacture, Capacity Planning, Layout Design, Line Balancing and Scheduling	04	01	02	
8	Automobile Technology			04	
9	PCB Fabrication Printed Circuit Board (PCB) fabrication and soldering and related technologies (Surface Mount (SM) and Ball Grid Array (BGA))			04	
	<b>Total (hours)</b>	20	07	36	-

*Note: L - Lectures, T - Tutorials, P - Practical, A - Assignments*

**References:**

1. Anderson, J., and Tatro, E.E., *Shop Theory*, 6<sup>th</sup> Edition, Tata McGraw-Hill, New Delhi, 2001.
2. Chapman, W.A.J., *Workshop Technology*, Part II.

<b>Assessment</b>	<b>Percentage Marks</b>	
Continuous Assessments	50	
Tutorials and Laboratory Work		20
Mid-Semester Examination		30
End of Semester Evaluation	50	
End of Semester Examination		50