

Semester:	2				
Course Code:	MI1010				
Course Name:	Fundamentals of Manufacturing				
Credit Value:	2 (Notional hours:100)				
Pre-requisites:	None				
Core/ Optional:	Core				
Hourly Breakdown	Lecture hrs	Tutoria l hrs	Practical class hrs	Assignment hrs	Independent Learning & Assessment hrs
	11	2	18	16	53

Course Aim: To provide fundamental knowledge and exposure on manufacturing engineering empowering students to evaluate, design and manufacture products to satisfy organizational and consumer requirements while adhering to the occupational health and safety standards

Intended Learning Outcomes:

On successful completion of the course, the students should be able to

- **Classify** production processes based on resources, production volumes, technology and demand
- **Describe** modern trends in manufacturing
- **Integrate** health and safety standards into shop floor work and industrial undertakings.
- **Apply** the knowledge and skill of manufacturing processes such as machining, forming, casting, joining processes, carpentry, Printed Circuit Boards (PCB) manufacture and additive manufacturing to manufacture a given product/ part with consideration of their impact on the economy, environment and society.

Course Content:

Introduction:

Types of manufacturing systems/ facilities

Relationship between product design and manufacturing

Introduction to Manufacturing Industry and Processes

New trends in manufacturing

Types of Manufacturing Processes

Safety at Engineering Workshops

Subtractive Manufacturing Processes-Machining and Machine tools

Introduction to advanced Machining Processes

CNC machining, EDM, ECM, Laser cutting, Waterjet cutting

Conventional Machining Processes

Lathe, Milling, Drilling, Shaping, etc. operations and machine tools.

Formative Manufacturing Processes

<p>Introduction to Forming processes</p> <p>Metal forming processes</p> <p> Bulk forming</p> <p> Sheet metal forming</p> <p>Non-Metal forming processes</p> <p> Polymers, Ceramics, Glasses</p> <p>Fundamentals of Casting</p> <p> Sand casting process</p> <p>Additive Manufacturing Processes</p> <p> 3D printing (incl. 3D scanning)</p> <p>Joining and Assembly Processes</p> <p> Welding</p> <p> Fastening</p> <p> PCB assembly and manufacture</p> <p> Woodwork</p> <p> Adhesive bonding</p>			
<p>Teaching/ Learning Methods:</p> <p>Classroom lectures, tutorial discussions, practical classes, in-class assignments, project-based learning, formative assessments</p>			
<p>Assessment Strategy:</p>			
<p>Continuous Assessment</p> <p>50%</p>		<p>Final Assessment</p> <p>50%</p>	
<p>Details:</p> <p>Assignments/ Quizzes - 10%</p> <p>Other %</p> <p> Laboratory work - 20%</p> <p> Problem Based Learning Activity - 20%</p>		<p>Theory (%)</p> <p>50</p>	<p>Practical (%)</p> <p>.....</p> <p>Other (%) (specify)</p> <p>.....</p>
<p>Recommended Reading:</p> <ul style="list-style-type: none"> ➤ Anderson, J., & Tatro, E. E. (1975). Shop Theory (6 ed.). New Delhi: Tata McGraw-Hill. ➤ Groover, M. P. (2019). Fundamentals of Modern Manufacturing: Materials, Processes, and Systems (7 ed.): Wiley. ➤ Kalpakjian, S., Schmid, S. R., Vijay Sekar, K. (2018). Manufacturing Engineering and Technology (8 ed). India: Pearson India Education Services. 			

- Krar, S., Gill, A., & Smid, P. (2011). *Technology of Machine Tools* (7 ed.). NY: McGrawHill