	National Institute of Technology Meghalaya An Institute of National Importance	CURRICULUM

Programme	**Bachelor of Technology in Mechanical Engineering**	Year of Regulation	**2018**
Department	**Mechanical Engineering**	Semester	**V**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
ME 301	**Manufacturing Technology-I**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives	To develop the student's ability to understand the basic concept of manufacturing processes, structure and properties of materials, and different heat treatment processes.	Course Outcomes	CO1	Summarize the various manufacturing processes and properties of materials. (Understanding)
	To develop the student's ability to understand the working principle of different types of casting process along with the casting defects and their remedies.		CO2	Explain the different types of metal casting processes, their advantages and disadvantages, casting defects and remedies. (Understanding)
	To familiarize the students with the working of different metal forming processes like, rolling, extrusion, wire drawing, sheet metal working, spinning, swaging, thread rolling, metal forming defects, powder metallurgy and its applications.		CO3	Explain the concept of various metal joining techniques, effect of various input parameters on joining behaviour, joining defects, etc. (Understanding)
	To develop the student's ability to understand the concept of different joining processes such as, brazing, soldering, welding, solid state welding methods; resistance welding; arc welding; submerged arc welding; inert gas welding; welding defects, and inspection.		CO4	Explain the working principle of various metal forming techniques. (Understanding)
			CO5	Apply the concept of powder metallurgy to manufacture ceramic-based product. (Applying)

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2	CO2	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**
3	CO3	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**
4	CO4	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**
5	CO5	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**
6	CO6	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

SYLLABUS

No.	Content	Hours	COs
I	**Manufacturing Process and Properties of Materials:** Introduction to Manufacturing Processes, Structure of Matter, Metals and Alloys, Deformation and Mechanical Properties of Materials, Heat Treatment etc.	**5**	**CO1**
II	**Casting Processes:** Introduction, pattern and mould, mould design, types and various pattern materials, various casting methods such as sand casting investment casting, pressure die casting, centrifugal casting, continuous casting, thin roll casting, casting defects and their remedies etc.	**15**	**CO2**
III	**Metal Joining Processes:** Brazing, soldering, welding, solid state welding methods; resistance welding; arc welding; submerged arc welding; inert gas welding; welding defects, inspection etc.	**10**	**CO3**
IV	**Metal forming Processes:** Various metal forming operations and their analysis such as forging, rolling, extrusion, wire drawing, sheet metal working, spinning, swaging, thread rolling, metal forming defects etc., powder metallurgy and its applications.	**10**	**CO4** **CO5**
	Total Hours	**40**	

Essential Readings

1. A Ghosh and A K Mallik, "Manufacturing Science", Wiley Eastern
2. P Rao, "Manufacturing Technology: Foundry, Forming and Welding", Tata McGraw Hill

Supplementary Readings

1. J.S Campbell, "Principles of Manufacturing Materials And Processes", Tata McGraw Hill
2. F C Flemmings, "Solidification Processing", Tata McGraw Hill
3. MP C Pandey and C K Singh, "Production Engineering Sciences", Standard Publishers Ltd
4. S Kalpakjian and S R Schmid, "Manufacturing Processes for Engineering Materials", Pearson Education