MME310: Manufacturing Technology-II

Programme: B. Tech Year: II Semester: IV
Course: Core Credits: 3 Hours: 40

Course Overview and Context:

The Manufacturing Technology-II course is designed to prepare students to understand different manufacturing processes like metal cutting processes, forming processes, plastic shaping processes. It also helps them to understand machine tools. By educating in the area of manufacturing students will enable to seek employment in engineering upon graduation while, at the same time, provide a firm foundation for the pursuit of graduate studies in engineering.

Prerequisite Courses: Fundamentals of Physics, Chemistry and Mathematics.

Text Books:

1. S. Kalpakjian, *Manufacturing Processes for Engineering Materials*, Pearson Education India, 2009.
2. M.P. Groover, *Fundamentals of Modern Manufacturing*, 4th Edition, John Wiley & Sons, INC. 2010.

Reference books:

[1] Amitabha Gosh, *Manufacturing Science, 2e,* East West press, 2010.
[2] HMT, *Production Technology*, Tata McGraw-Hill, 2001.
[3] Milton C. Shaw, *Metal Cutting Principles, 2e*, Oxford University Press, 2005.
[4] Philip F. Ostwald and Jairo Munoz, *Manufacturing Processes and Systems*, John Wiley and Sons, 9th Edition, 2002.
[5] P. N. Rao, *Manufacturing Technology", Volume II*, Tata McGraw Hill Publishing Co., New Delhi, 1998.

Additional Resources: NPTEL, MIT Video Lectures, Web resources etc.

Course Outcomes (COs): On completion of this course, the students will have:

		Linked Unit
CO 1	Analyze forces involved in machining operations	Unit 1
CO 2	Acquire the knowledge of metal cutting processes and machine tools. To select proper machining process for fabrication of required parts.	Unit 2
CO 3	Acquire the knowledge of metal forming processes and equipment for forming. To select proper forming technique suitable for required part production.	Unit 3
CO	Understand different processes for shaping of plastics and their	Unit 4

4	applications.	

UNITS	COURSE TOPICS	Lecture Hours	Student Development
UNIT 1	**Material Removal Processes:**	**7**	**Employability & Skill development**
	Theory of metal machining: Overview of Machining Technology, Theory of Chip Formation in Metal Machining, Force Relationships and the Merchant Equation, Power and Energy Relationships in Machining, Cutting Temperature.		
UNIT 2	**Cutting Tools, Machining Operations and Machine Tools:**	**13**	**Employability & Skill development**
	a. Cutting-tool technology: Tool Life, Tool Materials, Tool Geometry, Cutting Fluids. **b. Machining Operations and Machine Tools**: Machining and Part Geometry, Turning and Related Operations, Drilling and Related Operations, Milling, Machining Centers and Turning Centers, Other Machining Operations, Machining Operations for special Geometries, High-Speed Machining. Grinding and other abrasive processes.		
UNIT 3	**Metal Forming and Sheet Metalworking**	**13**	**Employability & Skill development**
	a. Fundamentals of metal forming: Overview of Metal Forming, Material Behavior in Metal Forming, Temperature in Metal Forming, Strain Rate Sensitivity, Friction and Lubrication in Metal Forming **b. Bulk deformation processes:** Rolling, Forging, Extrusion, Wire and Bar Drawing, **c. Sheet metalworking**: Cutting Operations, Bending Operations, Drawing, Dies and Presses for Sheet-Metal Processes, Bending of Tube Stock.		
UNIT 4	**Shaping Processes for Plastics**	**07**	**Employability & Skill development**
	Properties of Polymer Melts, Extrusion, Production of Sheet and Film, Fiber and Filament Production (Spinning), Coating Processes, Injection Molding, Compression and Transfer Molding, Blow Molding and Rotational Molding, Thermoforming, Casting, Polymer Foam Processing and Forming, Product Design Considerations.		

Evaluation Methods:

Item	Weightage (%)
Midterm	30
Assignment and Quiz	20
Final Examination	50
Attendance is not compulsory, but carry some bonus marks	

Prepared By: Dr. Deepak Rajendra Unune
Last Update: 22nd Nov. 2017.