

Subject Code: 01ME0721
Subject Name: Production Technology
B.Tech. IV Year (Sem-VII) Mechanical Engineering
Type of course: PE
Prerequisite: Basic concept of machining

Rationale: The course is prepared to provide the detailed understanding of Production Technology

Teaching and Examination Scheme:

Teaching Scheme(Hours)			Credits	Evaluation Scheme					Total Marks
Theory	Tutorial	Practical		Theory Marks			Practical Marks		
				ESE (E)	IA	CSE	Viva (V)	Term Work (TW)	
4	0	2	5	50	30	20	25	25	150

Course Outcome

Students will be able to

1. Understand the basic concept of Production Technology
2. Design of Jig and fixture for metal cutting
3. Application of jig and fixture and sheet metal operation
4. Analyzing the machining processes

Course Contents:

Sr no	Contents	Total hour	Weightage
1	Theory of Metal Cutting Principles of metal cutting, classification of Metal cutting/machining processes: Orthogonal and oblique cutting, Effect of tool geometry and other cutting parameters, Mechanisms of chip formation, Different types of chips, chip Breakers, specific cutting pressure, The forces acting on the cutting tool, measurement of cutting forces, Merchant's circle diagram, force dynamometer, force and velocity relationship, Tool wear, Factors causing tool wear, tool life, variables affecting tool life, economical cutting speed, machinability of metals	10	24

2	Thermal Aspects in Machining Sources of heat generation on in machining and its effects, Temperature Measurement techniques in machining, types of cutting fluids, Functions of cutting fluid, Characteristics of cutting fluid, Application of cutting fluids	8	19
3	Gear and Thread Manufacturing Different types of Threads manufacturing methods, and tools involved, Different gear forming and generating methods with their special features, Gears finishing process	4	10
4	Jigs and Fixtures Definition, Differences between Jigs and Fixtures, Its usefulness in mass production, design principles, location rule of 3-2-1 and its real world application, different types of locators, Principle of work piece control: geometric control, dimensional control and mechanical control, Different types of Clamps, bushes, Various Jigs and fixtures for machining operations	10	24
5	Press Tool : Classification of presses, Classification of dies, cutting actions in dies, clearance, cutting forces, Methods of reducing cutting forces, Center of Pressure, Different press tool operations like Blanking, Piercing, Drawing, Bending and Progressive Die design, scrap reduction, strip layout	10	24

Distribution of Theory Marks

Remembrance	Understanding	Application	Analyze	Evaluate
15	20	25	25	15

Reference Books:

1. Metal Cutting principles, by M C Shaw, Oxford University press
2. Fundamentals of machining and machine tools, by Boothroyd - CRC publication
3. Production Technology - H.M.T. By HMT
4. Tool Design by Donaldson, Tata McGraw Hill Pub.
5. Metal cutting Principles by Trent McGraw Hill Pub
6. Workshop Technology Vol. II by Raghuvanshi, Dhanpat rai Pub
7. Production Technology by R.K. Jain, Khanna Pub

List of experiments

1. Study of various types of cutting tools and measurement of tool geometry
2. To Understand the Effect of Chosen Parameters on the type of chip produced
3. Determination of chip-thickness ratio and shear plane Angle During Machining
4. Measurement of cutting forces in turning using Lathe Tool Dynamometer under various cutting conditions
5. To study the Temperature Measurement on chip tool interface
6. To study and understand the effect of a suitable cutting lubricant in metal cutting
7. Design a Jig and Fixture for given component
8. To study about different sheet metal operation

List of Open Source Software/learning website:

1. nptel.ac.in