



Subject Code: 01ME0801

Subject Name: Production Technology

B. Tech. Year - III (Semester - 8)

Type of course : Under Graduate

Prerequisite : Basic concept of machining.

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

Course Outcome :

After learning the course, the students will be competent to

1. Understand the basic concept of Production Technology.
2. Design of Jig and fixture for metal cutting.
3. Apply the knowledge of sheet metal operations in manufacturing industries.
4. Analyze the machining processes.

Teaching and Examination Scheme :

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

Content :

Sr. No.	Content	Total Hrs.
1	Introduction: 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
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.	08
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.	04

4	<p>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.</p>	10
5	<p>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.</p>	10

Distribution of Theory Marks

R Level	U Level	A Level	N Level	E` Level	C Level
10	20	25	25	10	10

Legends: R: Remember; **U:** Understand; **A:** Apply; **N:** Analyze; **E:** Evaluate; **C:** Create

List of Experiments :

1. Study of various types of cutting tools and measurement of tool geometry.
2. To Understand the Effect of 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 temperature measurement on chip tool interface.
6. To study and understand the effect of a suitable cutting lubricant and coolant.
7. Design Jig and Fixture for given Component.
8. To study about different sheet metal operation.

Major Equipment :

1. Lathe Tool Dynamometer
2. CAD Software.
3. Mechanical Workshop hand tool and Machinery.

Open Ended Project :

1. Software Based Design of Jig and Fixture.

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 publication.



5. Metal cutting Principles by Trent McGraw Hill publication
6. Workshop Technology Vol. II by Raghuvanshi, DhanpatRai publication
7. Production Technology by R.K. Jain, Khanna Pub

List of Open Base Software/learning website :

1. nptel.ac.in