

Subject Code: 1ET1010304	Subject Title: Manufacturing Processes-1
Pre-requisite Subject	Workshop

Course Objective:

This course will help student to

1. Understand the basic concept of machine and machining operations.
2. Analyze conventional machining processes.
3. Understand the sequence of machining operation to produce the end product.
4. Judge the limitations and scope of machines to perform variety of operations.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total (T+P)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	-	2	4	70	30	30	20	150

Subject Contents			
Sr. No.	Topic	Total Hours	Weight (%)
01	Introduction: Basic concepts of Machining and Machine Tools, Classification of Machine Tools, Basic motions in various machines tools. Cutting Tool – Types, specification and Geometry of Single Point Cutting Tool, Tool angle specification system (ASA and ORS), Chip formation, types of chips, chip breakers, Orthogonal and Oblique cutting, stress and strain in the chip, velocity relations, and power and energy requirement in metal cutting.	04	10
02	Lathe: Engine Lathes, Construction, Arrangement and Principle, Units of engine lathes, Work-holding devices, Types and size range of Engine lathes. Operations carried on Engine lathe, Different Attachments extending the processing capacities of engine lathes. Other types of lathe Machine- Plain turning lathe, Facing lathe, Multiple tool lathe. Simple purpose lathe, Capstan-Turret lathe, Horizontal and Vertical lathe.	10	25
03	Drilling and Boring Machine: Purpose and field of application of drilling and boring machines. Upright drill processes, radial drills, Horizontal and Precision Boring Machines. Different operations carried out on Drilling and Boring Machines.	05	10
04	Milling Machine: Milling machine and its types, milling operations, milling cutters, milling time and power estimates, indexing mechanism, indexing types- simple, compound and differential indexing, gear shaping, gear forming, gear hobbing, and gear	06	15

	shaving.		
05	Shaper, Planer and Slotter: Classification, Types, Basic operations on Shaper, Planer and Slotter.	05	10
06	Sawing and Broaching Machine: Metal sawing – classification, Reciprocating sawing machine, Circular sawing machine, Band sawing machine. Types of broaching machines, Advantages and Limitations.	04	10
07	Abrasive Machining Processes: Classifications of grinding machines, Cylindrical grinders, Internal grinders, Surface grinders, Tool and Cutter grinders, Abrasive Materials, Manufacture of grinding wheels, Super finishing processes- Lapping, honing, buffing, and polishing: Characteristics, machining and applications. Surface finishing process parameters and grades of surface finish	08	20

Course Outcome:

The students will be able to

1. Identify functional characteristics of various machines.
2. Acquire knowledge and ability to select parameters of machining.
3. Estimate the machining time on various machines.
4. Determine the machining process capabilities and limitations.

List of References:

1. S.K Hajra Choudhary and A.K Hajra Choudhary, “Workshop Technology”, Media Promoters and Publishers, 1992.
2. Jain R. K, “Production Technology”, Khanna Publishers, 2001.
3. Bawa H.S, “Workshop Technology”, Tata McGraw Hill, 1995.
4. Khanna O.P, “Manufacturing Processes”.
5. Chapman WAJ, “Workshop Technology”, Vol. I, II & III, 1972

List of Practical:

1. Demonstration on relative motions between cutting tool and work piece on machine (Lathe, Shaper, Milling, and Drilling).
2. Study about Work holding and tool holding devices on lathe.
3. Prepare a Job on Lathe Machine with given dimensions.
4. Demonstration of Capstan- Turret lathe.
5. Prepare a Job on Drilling Machine with given dimensions.
6. Demonstration of Indexing Mechanism for gear tooth cutting.
7. Prepare a Job on Milling Machine with given dimensions.
8. Prepare a Job on Shaper Machine with given dimensions.
9. Demonstration of Different Grinding Processes.