

Course Code	18ME46B	Course Title	Manufacturing Process - II	Semester	IV
Credits	3	L – T – P – TL*	3– 0 – 0 - 3	Teaching Hrs	42
Total Marks	100	CIE*	40	SEE*	60
*NOTE: L – Lecture; T – Tutorial; P – Practical; TL – Total; CIE – Continuous Internal Evaluation; SEE – Semester End Examination					
Course Learning Objectives: This course will enable students to;					Teaching Hr
1. To familiarize the student with tool nomenclature and cutting forces 2. To impart knowledge of machining parameters for different machining processes, tool life and tool wear. 3. To acquire the knowledge about various machining processes for production of complex shaped components. 4. To predict a suitable super finishing process to produce the intricate components.					
Module-1					
Theory of Metal Cutting: Introduction -Geometry of a single point cutting tool - Chip formation and types of chips–Orthogonal and oblique cutting – Merchant circle diagram for cutting forces - Shear angle in terms of chip thickness ratio and rake angle, friction. Factors affecting cutting tool life – Types of tool wear – Taylor’s tool life equation.					08
Cutting tool materials: Desired properties, types of cutting tool materials –HSS, carbides coated carbides, ceramics, cutting fluids: Desired properties, types and selection. Heat generation in metal cutting, factors affecting heat generation.					
Module-2					
Production Lathe: Classification of Lathes, Specification, Engine lathe, Capstan & Turret lathe - constructional features, tool layout, tool & workholding devices and attachments. Lathe operations.					08
Shaping, Slotting and Planning Machines Tools: Classification, constructional features of Shaper, Slotter, Planer. Driving mechanisms of Shaper, Slotter and Planer. Operations done on Shaper, Planer & Slotter. Difference between shaping and planning operations.					
Module-3					
Drilling Machines: Classification, constructional features, drilling & related operations, types of drill & drill bit nomenclature, drill materials.					08
Milling Machines: Principle of working, Classification of Milling machines, construction and working of Horizontal and vertical milling machines. Milling operations, methods of indexing, simple and compound indexing.					
Module-4					
Grinding: Working principle, constructional features of Cylindrical, Center less and Surface grinding machines, Types of abrasives, bonding process, marking of grinding wheels. Dressing and truing of grinding wheels.					09
Lapping, Honing and Broaching Machines					
Lapping – Principle of Lapping – Lapping methods – Advantages and limitations of lapping					
Honing – Principle of honing – Types of honing machines – Advantages, limitations and applications of honing.					

Module-5	09
<p>Broaching – Principle of working – Details of a commonly used broach – construction and working of a horizontal broaching machine – Advantages, limitations and applications.</p> <p>TOOL WEAR, TOOL LIFE: Introduction, tool wear mechanism, tool wear and tool failure, tool life, effects of cutting parameters on tool life, tool failure criteria, Taylor's tool life equation..</p>	
<p>Course outcomes: By the end of the course student shall be able to</p> <p>CO1: Analyze forces acting on the cutting tool in orthogonal and oblique cutting and various process parameters to improve the cutting tool life</p> <p>CO2: Describe various machining process used for machining of components.</p> <p>CO3: Explain various machines used for manufacturing of components.</p> <p>CO4: Identify the cutting tools required for different machining processes.</p>	
<p>Question paper pattern:</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question will be for 20 marks. • There will be two full questions (with a maximum of four sub- questions) from each module. • Each full question will have sub- question covering all the topics under a module. <p>The students will have to answer five full questions, selecting one full question from each module.</p>	
<p>Text Books:</p> <ol style="list-style-type: none"> 1. R.K Jain, Production Technology, Khanna Publications, 2003. 2. HMT, Production Technology, Tata McGraw Hill, 2001. <p>Reference Books:</p> <ol style="list-style-type: none"> 1. Hajra Choudhury, Workshop Technology Vol-II, Media Promoters & Publishers Pvt. Ltd. 2004 2. Amitabh Ghosh and Mallik Manufacturing Science, East West Press, 2003 3. G.C Sen& Bhattacharya Principle of Machine Tools, Tata Mcgraw hill, New Delhi 4. Kalpakjian, serope Manufacturing Engineering and Technology, Addison –wesley publishing co., New york 	