

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Mechatronics Engineering

Semester: 4

Subject Name MANUFACTURING ENGINEERING -I I

Sr. No.	Course content								
1.	INTRODUCTION AND FUNDAMENTALS OF METAL REMOVAL PROCESSES. 1.0 Need, Scope & importance of Manufacturing processes in industries. 1.1 List of major Manufacturing processes industries in GUJARAT . 1.2 Need of attitude, Knowledge & skill required for shop floor supervisor in Manufacturing processes industries. 1.3 Differentiate between forming and generating processes. 1.4 Movements of tool, job, slides and chuck during cutting operation, concepts of cutting speed, feed and depth of cut. 1.5 Mechanism of cutting action . 1.6 Chip formation, types of chips. 1.7 Orthogonal and oblique cutting. 1.8 Forces acting on tool and chip, methods to compute cutting force using dynamometer. 1.9 Functions and types of chip Breakers. 1.10 Cutting fluid- Basic need, types, properties and its applications. 1.11 Influence of cutting variables on surface finish, tool life, economy , and mass production. 1.12 Metal removal rate (MRR).								
2.	KINEMATICS OF MACHINES. 2.1 Definition and concept. 2.2 Various kinematics examples-sketch, elements, working and applications. 2.3 Common features of all machine tools. 2.4 Machine tool elements, drives and controls. 2.5 Common motion transmission methods in machine tools. 2.6 Principle of setting speed and feed.								
3.	BASIC MACHINE TOOLS 3.1 Define and classify basic machine tools. 3.2 Types, constructional features, transmissions, working principle, (using block diagram also),detailed specification, various mechanisms used, materials for important elements, and selection criteria of following basic machine tools. <table><tr><td>* Lathe Machine</td><td>* Drilling Machine</td></tr><tr><td>* Milling Machine</td><td>* Shaping Machine</td></tr><tr><td>* Slotting Machine</td><td>* Planning Machine</td></tr><tr><td>* Boring Machine.</td><td></td></tr></table> 3.3 Safety precautions.	* Lathe Machine	* Drilling Machine	* Milling Machine	* Shaping Machine	* Slotting Machine	* Planning Machine	* Boring Machine.	
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4.	CAPSTAN AND TURRET LATHE 4.1 Constructional features and working principle. 4.2 Functions and applications. 4.3 Difference between Capstan and Turret lathe. 4.4 Preparation of tool layout. 4.5. Merits and Demerits of Capstan and Turret lathe in comparison with basic centre lathe. 4.6 Safety precautions.
5.	CUTTING TOOLS 5.1 Various cutting tools materials, their compositions and properties. 5.2 Alloying elements in tool materials and their effects. 5.3 Carbide inserts, its designations, its need, applications and benefits.(As per ISO) 5.4. General cutting parameters for various cutting tools materials and work piece materials. 5.5 Various Cutting Tools (With tool geometry, nomenclature, tool materials, sketch/drawing of each, ISO/BIS standards,) used for various operations on Lathe Machine, Milling Machine, Drilling Machine, Shaping Machine, Slotting Machine, Boring Machine, Planning Machine and Capstan/Turret machines. Also specify cutting parameters for each cutting tool for commonly used work piece materials for commonly used operations. 5.6 Tool life, tool wear and machinability, factors affecting them. 5.7. Relation between cutting speed and tool life. 5.8 Resharpening of cutting tools.
6.	PRESSES AND PRESS TOOLS 6.1 Classifications, constructional features, working and applications of presses. Driving mechanism and its application criteria. 6.2 Press tools - Punch, Die, constructional features, Die assembly, punch and Die materials, clearance between punch and Die, Types of Dies, their working and its specific applications. 6.3 Press working - Various press working operations, its definition and field of applications. 6.4 Safety precautions

REFERENCE BOOKS:

- | | | |
|-----|---------------------------------|------------------------------|
| 1. | Workshop Technology I & II | J.A.Schey |
| 2. | Workshop Technology I & II | Raghuwanshi |
| 3. | Workshop Technology I, II & III | W.A.J. Chapman |
| 4. | Manufacturing Processes | M.L.Begman |
| 5. | Production Technology | R.K.Jain and S.C.Gupta |
| 6. | Welding Engineering | B.E.Rossi |
| 7. | Audles Welding Guide | F.D.Graham |
| 8. | Fundamentals of Tool design | ASTM |
| 9. | Fundamentals of Tool design | S.E.Rusinoff |
| 10. | Manufacturing Processes | H.H.Marshall |
| 11. | Production Technology | HMT |
| 12. | Production Technology | Cyril Donaldson, G.H.LeCain, |
| 13. | Tool design | V.C.Gloo |

