AMME13 MACHINE TOOLS AND PROCESSES

UNIT-1 MACHINE TOOLS

1.1 Introduction, Classification, construction and specifications of lathe, drilling machine, milling machine, boring machine, broaching machine, shaping machine,

1.2 Planning machine, grinding machine [Simple sketches showing major parts of the machines]

UNIT-2 MACHINING PROCESSES

2.1 Introduction, Types of motions in machining, turning and Boring, Shaping, Planing and Slotting, Thread cutting, Drilling and reaming, Milling,

2.2 Broaching, Gear cutting and Grinding, Machining parameters and related quantities. [Sketches pertaining to relative motions between tool and work piece only]

UNIT-3 CUTTING TOOL MATERIALS, GEOMETRY AND SURFACE FINISH

3.1 Desirable Properties and Characteristics of cutting tool materials,

3.2 Cutting tool geometry, cutting fluids and its applications, surface finish, effect of machining parameters on surface finish.

3.3 Machining equations for cutting operations: Turning, Shaping, Planning, slab milling, cylindrical grinding and internal grinding.

UNIT-4 MECHANICS OF MACHINING PROCESSES

4.1 Chip formation, Orthogonal cutting, Merchants model for orthogonal cutting, Oblique cutting,

4.2 Mechanics of turning process, Mechanics of drilling process, Mechanics of milling process.

UNIT-5 TOOL WEAR, TOOL LIFE

5.1 Introduction, tool wear mechanism, tool wear equations, tool life equations, effect of process parameters on tool life, machinability.

5.2 **Economics Of Machining Processes**: Introduction, choice of feed, choice of cutting speed,

5.3 Tool life for minimum cost and minimum production time, machining at maximum efficiency.

Reference Books:

1. Fundamental of Machining and Machine Tools, Geoffrey Boothroyd and Winston A. Knight, CRC Taylor & Francis, Third Edition.
2. Metal cutting principles, Milton C. Shaw, Oxford University Press, Second Edition,2005.