

Manufacturing Engineering – I
S.E. Sem. III [PROD]

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	–
Oral Exam	–	25
Term Work	–	–

SYLLABUS

1. **Definition** need and classification of machine tools: Brief history and development, typical features, associated with cutting, tools and Performance measures of machine tools.
 2. **Turning Mact Lines and Processes**
Lathe as general purpose turning machine, principle of generating surfaces, lathe specifications, description and functions of lathe, principle parts, back 'gear–all gear drive, feed mechanism, lathe accessories, and attachments–chucks, collets, mandrel, face plate. Lathe operations, taper turning methods thread cutting, cutting tools and tool geometry, Capstan and turret lathes : principal parts of capstan and turret lathes, difference between capstan and turret lathe, work holding devices, tool holding devices, tool dies, chasers, taps, etc., tool layout for simple components like bolt, nut, pin, shaft, single 'point cutting tools; Types, geometry, materials.
 3. **Drilling Machines and Processes**
Types–sensitive, upright, radial, gang, multiple spindle, automatic drilling machines, work and tool holding devices, drilling machine operation, types and materials of drills, twist drill nomenclature. Counter–boring–types of counter bores. Spot facing–Types of spot facers. Countersinking Types of countersinks. Reaming–Types of reamers. Tapping–Hand tap and machine tap. Machining time in drilling.
Deep hole drilling (only fundamentals to be covered): Gun drills, deep hole drilling machines Boring Machine.
 4. **Reciprocating Machine Tools**
Shaping machines: types of shapers, working of shaping machine, quick return mechanisms, shaper operations machining time planning machines: types of planning machines, planer mechanisms, feed mechanisms, work holding devices, shaper vs. planer. Slotting machines types of slotting machines, quick return mechanisms.
 5. **Milling Machines**
Types of milling machines–column and knee type, fixed bed type, planer type and special type milling processes conventional and climb milling, milling cutters, peripheral, face and shell milling cutters, geometry and materials of milling cutters attachments and special accessories for milling, universal dividing head indexing methods, direct, plain, compound and differential indexing mechanisms, arbors, adaptors and collets, chucks, calculations of machining time, copy milling machines.
 6. **Broaching Machines**
Broaching process, elements of typical internal broach, types of broaches, broaching machines-vertical, horizontal, surface and continuous broaching vs. other processes (design of broaches omitted).
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7. Cutting Off Machines

Power hack-saws, band saw and circular saw, friction saw and abrasive cutting off machines, field of applications and limitations, tools and accessories.

8. Finishing Processes

Honing-process, machine, honing stone, and tools, abrasive, grit size... Lapping-process, hand and machine lapping, flat internal and external cylindrical lapping, lap materials, medium, vehicles. Super finishing process-equipments, stones, fluids. Roller burnishing-process, tools, applications.

References :

1. Production Technology – HMT T.M.H. Publishing Co.
2. Elements of workshop technology (*Hajra Chowdhary and Bose*) – Vol. II
3. Material and manufacturing processes (*De Garmo*)
4. Manufacturing process (*Begman*)
5. Production Technology (*Raghuvanshi*)
6. Production Technology (*Chapman*) – Vol. 1 and 2 and 3
7. Production Technology (*R.K.Jain*)

