

MECHANICAL ENGINEERING DEPARTMENT

Session 2024-2025(2nd semester)

Subject:-Workshop Technology-I

Load:-3 hrs Theory

Lesson Plan

Week	THEORY	
	Day Lecture	Topic (Including Assignment/Test)
1	1	UNIT I: Hand Tools Chisels – Types and uses of chisels, wood working chisels, metal working chisels – cold chisel, hard chisel, stone chisel, masonry chisel.
	2	Hammers – Types, Basic design and variations, Physics of hammering, Hammer as force multiplier, effect of head's mass, effect of handle.
	3	Saw – Saw terminology, types of saws, types of saw blades, material used for saw, Hacksaw frame and its types.
2	1	Pliers – Function and types. Wrenches/ Spanners – Common General wrenches/spanners, Specialized wrenches/spanners,
	2	Surface plate, V block, files, Surface Gauge.
	3	Measuring Instruments: Calipers – Types – Inside, outside, divider, Odd leg caliper.
3	1	Vernier Caliper- Parts, uses, checking error, least count, working principle. Outside
	2	Micrometer - Introduction, parts, Principle, Least count, Checking zero error.
	3	UNIT II: Cutting Tools and Cutting Materials Cutting Tools - Various types of single point cutting tools and their uses,
4	1	Single point cutting tool geometry, tool signature and its effect,
	2	Heat produced during cutting and its effect, Cutting speed, feed and depth of cut and their effect.
	3	Cutting Tool Materials - Properties of cutting tool material
5	1	Study of various cutting tool materials viz. High-speed steel, tungsten carbide, cobalt steel cemented carbides, stellite, ceramics and diamond.
	2	Assignment 1
	3	1st Sessional test
	4	UNIT III: Welding: Welding Process - Principle of welding, Classification of welding processes, Advantages and limitations of welding,
6	1	Industrial applications of welding, Welding positions and techniques, symbols. Safety precautions in welding.
	2	Gas Welding - Principle of operation, Types of gas welding flames and their applications, Gas welding equipment - Gas welding torch, Oxygen cylinder, acetylene cylinder, cutting torch, Blow pipe, Pressure regulators, Filler rods and fluxes and personal safety equipment for welding.
	3	Arc Welding - Principle of operation, Arc welding machines and equipment. A.C. and D.C. arc welding, Effect of polarity, current regulation and voltage regulation,
7	1	Electrodes: Classification, B.I.S. specification and selection, Flux for arc welding. Requirements of pre heating, post heating of electrodes and work piece. Welding defects and their testing methods.

	2	UNIT IV: Lathe: Principle of turning, Description, and function of various parts of a lathe. Classification and specification of various types of lathes, Drives and transmission
	3	Work holding devices. Lathe tools: Parameters/Nomenclature and applications.
8	1	Lathe operations - Plain and step turning, facing, parting off, taper turning, eccentric turning, drilling, reaming, boring, threading and knurling, form turning, spinning.
	2	Cutting parameters – Speed, feed, and depth of cut for various materials and for various operations, machining time. Speed ratio, preferred numbers of speed selection.
	3	Lathe accessories:- Centers, dogs, different types of chucks, collets, face plate, angle plate, mandrel, steady rest, follower rest,
9	1	taper turning attachment, tool post grinder, milling attachment, Quick change device for tools.
	2	Brief description of capstan and turret lathe, comparison of capstan/turret lathe
	3	work holding and tool guiding devices in capstan and turret lathe.
10	1	Revision and Assignment-II
	2	2nd Sessional test
	3	UNIT V: Drilling: Principle of drilling. Classification of drilling machines and their description.
11	1	Various operation performed on drilling machine – drilling, spot facing, reaming, boring, counter boring, counter sinking, hole milling, tapping.
	2	Speeds and feeds during drilling, impact of these parameters on drilling, machining time.
	3	Types of drills and their features, nomenclature of a drill. Drill holding devices. Types of reamers.
12	1	Boring: Principle of boring, Classification of boring machines and their brief description.
	2	Specification of boring machines. Boring tools, boring bars and boring heads. Description of jig boring machine.
	3	Cutting Fluids and Lubricants: Function of cutting fluid, Types of cutting fluids,
13	1	Difference between cutting fluid and lubricant, Selection of cutting fluids for different materials and operations,
	2	Common methods of lubrication of machine tools,
	3	Certifying Organizations (such as SAE, ASTM) for rating standards of lubricants.
14	1	Revision
	2	Revision and Assignment-III
	3	3rd Sessional test
15	1	Revision

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