LESSON PLAN

NAME OF FACULTY: SHIV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING

SEMESTER: 2ND SEM

SUBJECT: WORKSHOP TECHNOLOGY - I

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: 3 LECTURES

Week	Theory	
	Lectures Day	**Topics**
1st	1	**UNIT I** **1. Hand Tools**
	2	Chisels – Types and uses of chisels, wood working chisels, metal working chisels – cold chisel, hard chisel, stone chisel, masonry chisel.
	3	Hammers – Types, Basic design and variations, Physics of hammering, Hammer as force multiplier
2nd	4	effect of head's mass, effect of handle.
	5	Saw – Saw terminology, types of saws, types of saw blades, material used for saw, Hacksaw frame and its types
	6	Pliers – Function and types. Wrenches/ Spanners – Common General wrenches/spanners, Specialized wrenches/spanners, Surface plate
3rd	7	V block, files, Surface Gauge
	8	**2. Measuring Instruments**
	9	Calipers – Types – Inside, outside, divider, Odd leg caliper
4th	10	Vernier Caliper- Parts, uses, checking error, least count, working principle
	11	Outside micrometer - Introduction, parts, Principle, Least count, Checking zero error.
	12	Revision
5th	13	1ST sessional
	14	**UNIT II** **3. Cutting Tools and Cutting Materials**
	15	Cutting Tools - Various types of single point cutting tools and their uses,
6th	16	Single point cutting tool geometry, tool signature and its effect
	17	Heat produced during cutting and its effect, Cutting speed, feed and depth of cut and their effect.
	18	Cutting Tool Materials - Properties of cutting tool material
7th	19	Study of various cutting tool materials viz. High-speed steel
	20	tungsten carbide, cobalt steel cemented carbides, stellite, ceramics and diamond

	21	**UNIT III** **4. Welding** Welding Process - Principle of welding, Classification of welding processes, Advantages and limitations of welding, Industrial applications of welding
8th	22	Welding positions and techniques, symbols. Safety precautions in welding
	23	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
	24	Arc Welding - Principle of operation, Arc welding machines and equipment
9th	25	A.C. and D.C. arc welding, Effect of polarity, current regulation and voltage regulation,
	26	Electrodes: Classification, B.I.S. specification and selection,
	27	Flux for arc welding. Requirements of pre heating, post heating of electrodes and work piece. Welding defects and their testing methods.
10th	28	**UNIT IV** **5. Lathe** Principle of turning, Description and function of various parts of a lathe. Classification and specification of various types of lathe, Drives and transmission, Work holding devices. Lathe tools: Parameters/Nomenclature and applications.
	29	Lathe operations - Plain and step turning, facing, parting off, taper turning, eccentric turning, drilling, reaming, boring, threading and knurling, form turning, spinning
	30	Cutting parameters – Speed, feed and depth of cut for various materials and for various operations, machining time. Speed ratio, preferred numbers of speed selection
11th	31	Lathe accessories:- Centers, dogs, different types of chucks, collets, face plate, angle plate, mandrel, steady rest, follower rest, taper turning attachment, tool post grinder, milling attachment
	32	Quick change device for tools. Brief description of capstan and turret lathe, comparison of capstan/turret lathe, work holding and tool guiding devices in capstan and turret lathe.
	33	Revision
12th	34	2ND sessional
	35	**UNIT V** **6. Drilling** Principle of drilling. Classification of drilling machines and their description. Various operation performed on drilling machine – drilling, spot facing, reaming, boring, counter boring, counter sinking,

		hole milling, tapping
	36	Speeds and feeds during drilling, impact of these parameters on drilling, machining time. Types of drills and their features, nomenclature of a drill. Drill holding devices. Types of reamers.
13th	37	**7. Boring** Principle of boring, Classification of boring machines and their brief description.
	38	Specification of boring machines. Boring tools, boring bars and boring heads. Description of jig boring machine.
	39	**8. Cutting Fluids and Lubricants** Function of cutting fluid, Types of cutting fluids, Difference between cutting fluid and lubricant
14th	40	Selection of cutting fluids for different materials and operations, Common methods of lubrication of machine tools,
	41	Certifying Organizations (such as SAE, ASTM) for rating standards of lubricants.
	42	Revision
15th	43	3RD sessional
	44	Revision
	45	Revision