LESSON PLAN

NAME OF FACULTY : SUNIL KUMAR

DISCIPLINE : MECHANICAL ENGINEERING - G.P. MANDI ADAMPUR

SEMESTER : III

SUBJECT : WORKSHOP TECHNOLOGY-I

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK : 4 Lectures

WEEK	THEORY	
	LECTURE NO.	TOPIC
1st	1	**UNIT 1: Welding: 1.1 WELDING PROCESS** Principle of welding, Classification of welding processes
	2	Advantages and limitations of welding, Industrial applications of welding
	3	Welding positions and techniques
	4	Symbols, Safety precautions in welding.
2nd	5	**1.2 GAS WELDING** Principle of operation, Types of gas welding flames and their applications
	6	Gas welding equipment - Gas welding torch, Oxygen cylinder, acetylene Cylinder
	7	Cutting torch, Blow pipe, Pressure regulators, Filler rods and fluxes
	8	Personal safety equipment for welding.
3rd	9	**1.3 ARC WELDING** Principle of operation, Arc welding machines and equipment.
	10	A.C. and D.C. arc welding, Effect of polarity, current regulation and voltage
	11	**Electrodes**: Classification, B.I.S. specification and selection, Flux for arc welding.
	12	Welding defects and their testing methods.
4th	13	**1.4 OTHER WELDING PROCESSES Resistance welding**: Principle, advantages, limitations, working and applications of spot welding seam welding, projection welding and percussion welding
	14	Atomic hydrogen welding, Shielded metal arc welding
	15	Submerged arc welding, Welding distortion, welding defects
	16	**SESSIONAL TEST -I**
5th	17	Methods of controlling welding defects and inspection of welded joints.
	18	**1.5 MODERN WELDING METHODS** Methods, Principle of operation
	19	Advantages, disadvantages and applications of Tungsten inert gas (TIG) welding, Metal inert gas (MIG) welding
	20	Thermit welding, Electro slag welding, Electron beam welding
6th	21	Ultrasonic welding, Laser beam welding, Robotic welding
	22	**UNIT 2 FOUNDARY TECHNIQUES 2.1 PATTERN MAKING** Types of pattern, Pattern material, Pattern allowances
	23	Pattern codes as per B.I.S., Introduction to cores, core boxes and core materials
	24	Core making procedure, Core prints, positioning of cores
7th	25	**2.2 MOULDING AND CASTING 2.2.1 MOULDING SAND** Properties of moulding sand, their impact and control of properties viz. permeability, refractoriness, adhesiveness, cohesiveness, strength, flow ability, collapsibility

	26	Various types of moulding sand
	27	Testing of moulding sand. Safety precautions in foundry
	28	**2.2.2 MOULD MAKING** Types of moulds, Step involved in making a mould, Molding boxes, hand tools used for mould making
8th	29	Molding processes: Bench molding, floor molding, pit molding and machine
	30	Molding machines squeeze machine, jolt squeeze machine and sand slinger.
	31	**2.2.3 CASTING PROCESSES** Charging a furnace, melting and pouring both ferrous and non ferrous metals
	32	Cleaning of castings, Principle, working and applications of Die casting
9th	33	Hot chamber and cold chamber, Centrifugal casting
	34	**2.2.4 GATING AND RISERING SYSTEM** Elements of gating system, Pouring basin, sprue, runner, gates
	35	Types of risers
	36	location of risers, Directional solidification
10th	37	**2.2.5 MELTING FURNACES** Construction and working of Pit furnace
	38	Cupola furnace
	39	Crucible furnace – tilting type, Electric furnace
	40	**2.2.6 CASTING DEFECTS** Different types of casting defects
11th	41	Testing of defects: radiography, magnetic particle inspection and ultrasonic inspection
	42	**SESSIONAL TEST -II**
	43	**UNIT 3 METAL FORMING PROCESSES 3.1 PRESS WORKING** Types of presses, type of dies, selection of press die, die material
	44	Press Operations-Shearing, piercing, trimming, punching, notching
12th	45	Shaving, gearing, embossing, stamping
	46	**3.2 Forging** - Open die forging, closed die forging, Press forging
	47	Upset forging, swaging, up setters
	48	Roll forging, Cold and hot forging
13th	49	**3.3 Rolling** - Elementary theory of rolling, Types of rolling mills
	50	Thread rolling, roll passes
	51	Rolling defects and remedies
	52	**3.4 Extrusion and Drawing** - Type of extrusion- Hot and Cold
14th	53	Direct and indirect
	54	Pipe drawing, tube drawing, wire drawing
	55	**UNIT 4 PLASTIC PROCESSING 4.1** Industrial use of plastics and applications
	56	Advantages and limitations of use of plastics
15th	57	**4.2** Injection moulding-principle, working of injection moulding machine
	58	**4.3** Compression moulding-principle, and working of compression moudling machine
	59	Revision
	60	**SESSIONAL TEST -III**