Lesson Plan

Name of the Faculty : Sh. Deepak Malhotra

Discipline : Mechanical Engineering

Semester : 3rd

Subject : Workshop Technology - I

Lesson Plan duration : 17 weeks (15.09.2022 to 16.01.2023)

Work load per week : Lecture – 03, Practical – 00

Week	Theory		EXECUTION	
	Lecture Day	Topic (Including assessment/test)	Date	Sign.
1st	1st	Introduction about the subject & brief overview.		
	2nd	**Unit 1: Welding :** **1.1 Welding Process:** Principle of welding, Classification of welding processes, Advantages and limitations of welding,		
	3rd	Industrial applications of welding, Welding positions and techniques, symbols. Safety precautions in welding.		
2nd	4th	**1.2 Gas Welding :**Principle of operation, Types of gas welding flames and their applications		
	5th	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		
	6th	**1.3 Arc Welding:** Principle of operation, Arc welding machines and equipment. A.C. and D.C. arc welding		
3rd	7th	Effect of polarity, current regulation and voltage regulation, Electrodes: Classification, B.I.S. specification and selection,		
	8th	Flux for arc welding. Requirements of pre heating, post heating of electrodes and work piece, Welding defects and their testing methods		
	9th	**1.4 Other weldingProcesses:** Resistance welding: Principle, advantages, limitations, working and applications of spot welding		
4th	10th	Seam welding, projection welding and percussion welding, Atomic hydrogen welding,		

	11th	Submerged arc welding, Welding distortion, welding defects, Shielded metal arc welding. Methods of controlling welding defects and inspection of welded joints		
	12th	**1.5 Modern Welding Methods:** Methods, Principle of operation, advantages, disadvantages and applications of Tungsten inert gas (TIG) welding		
5th	13th	Methods, Principle of operation, advantages, disadvantages and applications ofMetal inert gas (MIG) welding		
	14th	Thermit welding, Electro slag welding, Electron beam welding, Ultrasonic welding, Laser beam welding, Robotic welding		
	15th	**Unit 2: Foundry Techniques** **2.1 Pattern Making:** Types of pattern, Pattern material, Pattern allowances, Pattern codes as per B.I.S.,		
6th	16th	Introduction to cores, core boxes and core materials, Core making procedure, Core prints, positioning of cores		
	17th	**2.2 Moulding and Casting:** **2.2.1 Moulding Sand:** Properties of moulding sand, their impact and control of properties viz. permeability, refractoriness, adhesiveness		
	18th	Cohesiveness, strength, flow ability, collapsibility, Various types of mouldingsand,Testing of moulding sand. Safety precautions in foundry.		
7th	19th	**1st sessional test (Tentative)**		
	20th	**Assessment**		
	21st	**2.2.2 Mould Making:** Types of moulds, Step involved in making a mould, Molding boxes, hand tools used for mould making, Molding processes: Bench molding		
8th	22nd	floor molding, pit molding and machine molding, Molding machines squeeze machine, jolt squeeze machine and sand slinger		
	23rd	**2.2.3 Casting Processes:** Charging a furnace, melting and pouring both ferrous and non-ferrous metals		
	24th	cleaning of castings, Principle, working and applications of Die casting		
9th	25th	hot chamber and cold chamber, Centrifugal casting		
	26th	**2.2.4 Gating and Risering System:** Elements of gating system, Pouring basin, sprue, runner, gates, Types of risers, location of risers, Directional solidification		
	27th	**2.2.5 Melting Furnaces:** Construction and working of Pit furnace		
10th	28th	Cupola furnace, Crucible furnace – tilting type, Electric furnace		
	29th	**2.2.6 Casting Defects:** Different types of casting defects		

	30th	Testing of defects: radiography, magnetic particle inspection, Ultrasonic inspection		
11th	31st	**Unit 3: Metal Forming Processes** **3.1 Press Working** - Types of presses, type of dies		
	32nd	Selection of press die, die material. Press Operations- Shearing		
	33rd	Piercing, trimming, punching, notching, shaving, gearing, embossing, stamping		
12th	34th	**2nd sessional test (Tentative)**		
	35th	**Assessment**		
	36th	**3.2 Forging -** Open die forging, closed die forging		
13th	37th	Press forging, upset forging, swaging, up setters, Cold and hot forging		
	38th	**3.3 Rolling -** Elementary theory of rolling, Types of rolling mills		
	39th	Thread rolling, roll passes, Rolling defects and remedies		
14th	40th	**3.4 Extrusion and Drawing** - Type of extrusion- Hot and Cold, Direct and indirect,		
	41st	**3.4 Extrusion and Drawing** - Pipe drawing, tube drawing, wire drawing		
	42nd	**Unit 4: Plastic Processing:** 4.1 Industrial use of plastics, and applications, Advantages and limitations of use of plastics		
15th	43rd	4.2 Injection moulding-principle, working of injection moulding machine.		
	44th	4.3 Compression moulding- principle, and working of compression moudling machine.		
	45th	Revision		
16th	46th	**3rd sessional test (Tentative)**		
	47th	**Assessment**		
	48th	Revision		
17th	49th	Revision		
	50th	Revision		
	51st	Revision		