Lesson Plan

Name of the Faculty : Sh. Sunil Chaudhry

Discipline : Mechanical Engineering

Semester : 3rd

Subject : Workshop Technology - I

Lesson Plan duration : 17 weeks (01.10.2021 to 28.01.2022)

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

Week	Theory	
	Lecture Day	Topic (Including assessment/test)
1st	1st	**Unit 1: Welding :** **1.1 Welding Process:** Principle of welding, Classification of welding processes, Advantages and limitations of welding,
	2nd	Industrial applications of welding, Welding positions and techniques, symbols. Safety precautions in welding.
	3rd	**1.2 Gas Welding :**Principle of operation, Types of gas welding flames and their applications
2nd	4th	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
	5th	**1.3 Arc Welding:** Principle of operation, Arc welding machines and equipment. A.C. and D.C. arc welding
	6th	Effect of polarity, current regulation and voltage regulation, Electrodes: Classification, B.I.S. specification and selection,
3rd	7th	Flux for arc welding. Requirements of pre heating, post heating of electrodes and work piece, Welding defects and their testing methods
	8th	**1.4 Other weldingProcesses:** Resistance welding: Principle, advantages, limitations, working and applications of spot welding
	9th	Seam welding, projection welding and percussion welding, Atomic hydrogen welding,
4th	10th	Submerged arc welding, Welding distortion, welding defects, Shielded metal arc welding. Methods of controlling welding defects and inspection of welded joints
	11th	**1.5 Modern Welding Methods:**Methods, Principle of operation, advantages, disadvantages and applications of Tungsten inert gas (TIG) welding
	12th	Methods, Principle of operation, advantages, disadvantages and applications ofMetal inert gas (MIG) welding
5th	13th	Thermit welding, Electro slag welding, Electron beam welding, Ultrasonic welding, Laser beam welding, Robotic welding
	14th	**Unit 2: Foundry Techniques** **2.1 Pattern Making:**Types of pattern, Pattern material, Pattern allowances, Pattern codes as per B.I.S.,

	15th	Introduction to cores, core boxes and core materials, Core making procedure, Core prints, positioning of cores
6th	16th	**2.2 Moulding and Casting:** **2.2.1 Moulding Sand:**Properties of moulding sand, their impact and control of properties viz. permeability, refractoriness, adhesiveness
	17th	Cohesiveness, strength, flow ability, collapsibility, Various types of mouldingsand,Testing of moulding sand. Safety precautions in foundry.
	18th	**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
7th	19th	**1st sessional test (Tentative)**
	20th	**Assessment**
	21st	floor molding, pit molding and machine molding, Molding machines squeeze machine, jolt squeeze machine and sand slinger
8th	22nd	**2.2.3 Casting Processes:**Charging a furnace, melting and pouring both ferrous and non-ferrous metals
	23rd	cleaning of castings, Principle, working and applications of Die casting
	24th	hot chamber and cold chamber, Centrifugal casting
9th	25th	**2.2.4 Gating and Risering System:**Elements of gating system, Pouring basin, sprue, runner, gates, Types of risers, location of risers, Directional solidification
	26th	**2.2.5 Melting Furnaces:** Construction and working of Pit furnace
	27th	Cupola furnace, Crucible furnace – tilting type, Electric furnace
10th	28th	**2.2.6 Casting Defects:** Different types of casting defects
	29th	Testing of defects: radiography, magnetic particle inspection, Ultrasonic inspection
	30th	**Unit 3: Metal Forming Processes** **3.1 Press Working** - Types of presses, type of dies
11th	31st	**2nd sessional test (Tentative)**
	32nd	**Assessment**
	33rd	Selection of press die, die material. Press Operations-Shearing
12th	34th	Piercing, trimming, punching, notching, shaving, gearing, embossing, stamping
	35th	**3.2 Forging -** Open die forging, closed die forging
	36th	Press forging, upset forging, swaging, up setters, Cold and hot forging
13th	37th	**3.3 Rolling -** Elementary theory of rolling, Types of rolling mills
	38th	Thread rolling, roll passes, Rolling defects and remedies
	39th	**3.4 Extrusion and Drawing** - Type of extrusion- Hot and Cold, Direct and indirect, Pipe drawing, tube drawing, wire drawing
14th	40th	**Unit 4: Plastic Processing:** 4.1 Industrial use of plastics, and applications

	41st	Advantages and limitations of use of plastics
	42nd	4.2 Injection moulding-principle, working of injection moulding machine.
15th	43rd	Compression moulding- principle, and working of compression moudling machine.
	44th	**3rd sessional test (Tentative)**
	45th	**Assessment**
16th	46th	Revision
	47th	Revision
	48th	Revision
17th	49th	Revision
	50th	Revision
	51st	Revision