LESSON PLAN

Name of Faculty: Manoj Gill **Discipline: Mechanical Engg.**

Semester: 3rd **Subject: Workshop Technology-2**

Lesson Plan Duration: 15 Weeks **Work Load: Theory- 3 Lectures/Week**

		THEORY	
WEEK	**LECTURE NO.**	**TOPIC**	**Covered on Date**
1	**1**	**UNIT-1: WELDING (16 Periods)** 1.1 Resistance Welding: 1.1.1 Principle	
	2	1.1.2 Advantages and limitations	
	3	1.1.3 Working and applications of spot welding and seam welding	
2	**4**	1.2 Other Welding Processes: 1.2.1 Principle	
	5	1.2.2 Advantages, limitations	
	6	1.2.3 Working and applications of Shielded metal arc welding	
3	**7**	1.2.4 Submerged arc welding.	
	8	1.3 Welding defects 1.3.1 Methods of controlling welding defects	
	9	1.3.2 Inspection of welded joints	
4	**10**	1.4 Modern Welding Methods: 1.4.1 Methods, Principle of operation, advantages, disadvantages and applications of, Tungsten inert gas (TIG) welding	
	11	1.4.2 Metal inert gas (MIG) welding	
	12	1.4.3 Thermit welding	
5	**13**	1.4.4 Electro slag welding, Electron beam welding	
	14	1.4.5 Ultrasonic welding	
	15	1.4.6 Laser beam welding	
6	**16**	1.4.7 Robotic welding	
	17	**UNIT-2: FOUNDARY TECHNIQUES (15 Periods)** 2.1 Pattern Making: 2.1.1 Types of pattern, Pattern material, Pattern allowances	
	18	2.1.2 Pattern codes as per B.I.S., Introduction to cores, core boxes and core materials	
7	**19**	2.1.3 Core making procedure, Core prints, positioning of cores	
	20	2.2 Moulding and Casting: 2.2.1 Moulding Sand, Properties of moulding sand, their impact	

	21	2.2.2 Various types of moulding sand, Testing of moulding sand. Safety precautions in foundry	
8	**22**	2.3 Mould Making: 2.3.1 Types of moulds, Steps involved in making a mould	
	23	2.3.2 Molding boxes, hand tools used for mould making	
	24	2.3.3 Molding processes: Bench molding, floor molding, pit molding and machine molding	
9	**25**	2.3.4 Molding machines squeeze machine, jolt squeeze machine and sand slinger	
	26	2.4 Casting Processes: 2.4.1 Charging a furnace, melting and pouring both ferrous and non-ferrous metals, cleaning of castings	
	27	2.4.2 Principle, working and applications of Die casting: hot chamber and cold chamber, Centrifugal casting	
10	**28**	2.5 Gating and Risering System: 2.5.1 Elements of gating system, Pouring basin, sprue, runner, gates	
	29	2.5.2 Types of risers, location of risers, Directional solidification	
	30	2.6 Melting Furnaces: 2.6.1 Construction and working of Pit furnace, Cupola furnace, Crucible furnace – tilting type, Electric furnace	
11	**31**	2.7 Casting Defects: 2.7.1 Different types of casting defects, Testing of defects: radiography, magnetic particle inspection and ultrasonic inspection.	
	32	**UNIT-3 :SHAPING, SLTTING AND PLANING (07 Periods)** 3.1 Shaper, Slotter and Planer: 3.1.1 Working principle and construction of shaper, slotter and planer	
	33	3.1.2 Type of shapers and slotters, types of planers	
12	**34**	3.1.3 Quick return mechanism applied to shaper and planer machine	
	35	3.1.4 Work holding devices used on shaper and planer	
	36	3.1.5. Types of tools used and their geometry, Specification of shaper and planer, Speeds and feeds in above processes	
13	**37**	3.2 Broaching: 3.2.1 Introduction to broaching, nomenclature of broach tools, types and material	
	38	3.2.2 Types of broaching machines – single ram and duplex ram horizontal type, vertical type pull up, pull down and push down.	
	39	**UNIT-4 :MILLING (05 Periods)** 4.1 Milling methods - up milling and down milling, Specification and working principle of milling machine	
14	**40**	4.2 Classification, brief description and applications of milling machines, details of column and knee type milling machine	
	41	4.3 Milling machine accessories and attachment – Arbors, adaptors, collets, vices, circular table, indexing head and tail stock, vertical milling attachment, rotary table	
	42	4.4 Identification of different milling cutters and work mandrels, Work holding devices	

15	**43**	4.5 Milling operations – face milling, angular milling, form milling,straddle milling and gang milling, Cutting parameters	
	44	**UNIT-5 :JIGS AND FIXTURES (02 Periods)** 5.1 Importance and use of jigs and fixtures, difference between jig and fixture, Principal of location	
	45	5.2 Locating and clamping devices, Types of jigs – drilling jig, template jig and plate jig, Types of fixtures – Milling and welding fixture	