LESSON PLAN

FACULTY NAME: **SH. VIKAS**

DISCIPLINE: **MECHANICAL ENGINEERING**

SEMESTER: **3rd**

SUBJECT: **WORKSHOP TECHNOLOGY-II**

LESSON PLAN DURATION: **15 WEEKS**

WORK LOAD (LECTURE/PRACTICAL)/WEEK**: (3L)**

WEEK	THEORY	
	Day Lecture	**Topic(Including Assignment/Test)**
1	1	**Unit 1-Welding:** Resistance welding: Principle, advantages, limitations
	2	working and applications of spot welding and seam welding
	3	**Other Welding Processes:** Principle, advantages, limitations, working and applications of Shielded metal arc welding, submerged arc welding
2	4	Welding defects, methods of controlling welding defects and inspection of welded joints.
	5	**Modern Welding Methods:** Methods, Principle of operation, advantages, disadvantages and applications of, Tungsten inert gas (TIG) welding, Metal inert gas (MIG) welding
	6	Methods, Principle of operation, advantages, disadvantages and applications of Thermit welding, Electro slag welding, Electron beam welding,
3	7	Methods, Principle of operation, advantages, disadvantages and applications of Electron beam welding, Ultrasonic welding
	8	Methods, Principle of operation, advantages, disadvantages and applications of Laser beam welding, Robotic welding
	9	**Unit 2-Foundry Techniques :** **Pattern Making:** Types of pattern, Pattern material, Pattern allowances
4	10	Pattern codes as per B.I.S., Introduction to cores, core boxes and core materials
	11	Core making procedure, Core prints, positioning of cores
	12	**Moulding and Casting:** Moulding Sand: Properties of moulding sand, their impact and control of properties, permeability, refractoriness, adhesiveness, cohesiveness, strength
5	13	flowability, collapsibility, Various types of moulding sand, Testing of moulding sand.
	14	Mould Making: Types of moulds, Step involved in making a mould, Molding boxes, hand tools used for mould making,
	15	Molding processes: Bench molding, floor molding, pit molding and machine molding.
6	16	Revision for 1ST SESSIONAL TEST **ASSIGNMENT- 1**
	17	**1ST SESSIONAL TEST**
	18	Casting Processes: Charging a furnace, melting and pouring both ferrous and non ferrous metals, cleaning of castings,

7	19	Principle, working and applications of Die casting: hot chamber and cold chamber, Centrifugal casting
	20	Gating and Risering System: Elements of gating system, Pouring basin, sprue, runner, gates,
	21	Types of risers, location of risers, Directional solidification
8	22	Melting Furnaces: Construction and working of Pit furnace, Cupola furnace, Crucible furnace – tilting type, Electric furnace
	23	Casting Defects: Different types of casting defects,
	24	Non destructive testing (NDT) of castings: die penetration test, radiography, magnetic particle inspection and ultrasonic inspection.
9	25	**Unit 3- Shaping, Slotting and Planing:** Working principle and construction of shaper, slotter and planer Type of shapers and slotters
	26	Type of planers, Quick return mechanism applied to shaper and planer machine
	27	Work holding devices used on shaper and planer
10	28	Types of tools used and their geometry.
	29	Specification of shaper and planer. Speeds and feeds in above processes. **ASSIGNMENT- 2**
	30	**2ND SESSIONAL TEST**
11	31	**Broaching:** Introduction to broaching, Nomenclature of broach tools, types and material
	32	Types of broaching machines – single ram and duplex ram horizontal type, vertical type pull up, pull down and push down.
	33	**Unit-4 Milling** Milling methods - up milling and down milling, Specification and working principle of milling machine
12	34	Classification, brief description and applications of milling machines, Details of column and knee type milling machine
	35	Milling machine accessories and attachment – Arbors, adaptors, collets, vices, circular table, indexing head and tail stock,
	36	vertical milling attachment, rotary table. Identification of different milling cutters and work mandrels,
13	37	Work holding devices, Milling operations – face milling, angular milling, form milling, straddle milling and gang milling. Cutting parameters
	38	**Unit-4 Jigs and Fixtures:** Importance and use of jigs and fixtures, difference between jig and fixture.
	39	Locating and clamping devices , Principal of location
14	40	Types of jigs – drilling jig, template jig and plate jig
	41	Types of fixtures – Milling and welding fixture **ASSIGNMENT-3**
	42	**3RD SESSIONAL TEST**
15	43	Revision
	44	Revision
	45	Revision