

LESSON PLAN

NAME OF FACULTY: SHIV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING

SEMESTER: 2ND SEM

SUBJECT: WORKSHOP PRACTICE - I

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: 6 PRACTICALS

Week	Lecture Day	Topics
1 st	1.	1. WELDING SHOP – II
	2.	1.1 Safety Precautions of concerned shop and use of personal protective equipment (PPE)
	3.	demonstration of tools
	4.	equipment, sample jobs, Best practices in the concerned shop
	5.	1.2 Introduction to gas welding, gas welding equipment, introduction to soldering and brazing, introduction to resistance welding, safety precautions
	6.	1.3 Identification and adjustment of various types of gas flames
2 nd	7.	1.4 Demonstration of brazing and gas cutting
	8.	1.5 Demonstration of Welding defects
	9.	1.6 Jobs to be prepared
	10.	Job I Beading Practice by gas welding
	11.	Job II Preparation of lap joint on M.S. flat using gas welding
	12.	Job III Preparation of double V butt joint/corner joint on M.S. flat using gas welding / arc welding process
3 rd	13.	Job IV Preparation of pipe joint using gas/arc welding
	14.	Job V Preparation of a small cot frame/stool/table frame/drawing table frame) using gas or arc welding.
	15.	2. FITTING AND PLUMBING SHOP – II
	16.	2.1 Safety Precautions of concerned shop and use of personal protective equipment (PPE), demonstration of tools, equipment, sample jobs, Best practices in the concerned shop
	17.	2.2 Handling of measuring instruments, Use of dial gauges and feeler gauges
	18.	Copy checking
4 th	19.	2.3 Demonstration of various types of drills, taps and dies
	20.	2.4 Introduction to tapping and dieing
	21.	Job I To perform drilling and reaming operation on mild steel flat.
	22.	2.5 file and make angle, surfaces (Bevel gauge accuracy 1 degree) make simple open and sliding fits Inside square fit, make combined open and sliding fit, straight sides
	23.	Job II To make assembly for V shape or square shape fit
	24.	Job III Radius form filing on the corners

5 th	25.	2.6 Sliding fitting, Diamond fitting, Lapping flat surfaces using lapping plate. Application of lapping, material for lapping tools, lapping abrasives, charging of lapping tool. Surface finish importance, equipment for testing-terms relation to surface finish
	26.	Job IV To make step assembly
	27.	2.7 Introduction to various types of threads (internal and external)-single start, multi-start, left hand and right hand threads
	28.	2.8 Description and demonstration of various types of drills, taps and dies. Selection of dies for threading, selection of drills, taps and reamers for tapping operations
	29.	2.9 Introduction to use of plumbing tools like pipe wrench , plumber vice and materials like Putty, thread, duct(Teflon) tape, epoxy resin, araldite, m-seal
	30.	2.10 Precautions while drilling soft metals, e.g. copper, brass, aluminium etc
6 th	31.	Job V To make overhead tank assembly with GI/C-PVC pipes and joints
	32.	Copy checking
	33.	3. CARPENTRY SHOP – II
	34.	3.1 Safety Precautions of concerned shop and use of personal protective equipment (PPE), demonstration of tools, equipment, sample jobs, Best practices in the concerned shop
	35.	3.2 Introduction to joints, their relative advantages and uses
	36.	Job I To make a dovetail joint
7 th	37.	Job II To make a mitred joint.
	38.	Job III To make a lengthening joint by using different joints
	39.	3.3 Demonstration of machines like Band Saw and Circular Saw, Chain and Chisel, Universal wood working machine, Saw re-sharpening machine, Saw Brazing unit
	40.	3.4 Introduction and function of various parts of Wood Working Lathe
	41.	a) Study of wood working lathe tool.
	42.	b) Sharpening of lathe tools.
8 th	43.	c) Setting of jobs and tools
	44.	Job IV To make a job using different type of wood turning operations including form turning and grooving
	45.	OR Repair of any utility item. Job V To make a medium size wooden dust bin/ wooden tray
	46.	4. SMITHY SHOP
	47.	4.1 Safety Precautions of concerned shop and use of personal protective equipment (PPE), demonstration of tools, equipment, sample jobs, Best practices in the concerned shop
	48.	4.2 Introduction and industrial applications of smithy jobs
9 th	49.	4.2.1 Purpose of Smithy shop
	50.	4.2.2 Different types of Hearths used in Smithy shop, Types of fuel used and maximum temperature obtained
	51.	4.2.3 Purpose, specifications, uses, care and maintenance of various tools and equipment used in hand forging by segregating as cutting tools, supporting tools, holding tools, measuring tools, punches etc.
	52.	4.2.4 Types of raw materials used in Smithy shop.
	53.	4.2.5 Uses of Fire Bricks and Clays in Forging workshop

	54.	4.3 Practice
10 th	55.	4.3.1 Practice of firing of hearth/Furnace, Cleaning of Clinkers and Temperature Control of Fire
	56.	4.3.2 Practice on different basic Smithy/Forging operations such as Cutting, Upsetting, Drawing down, Setting down, Necking, Bending, Fullering, Swaging, Punching and Drifting
	57.	Demonstration of making cube, hexagonal cube, hexagonal bar from round bar
	58.	4.3.3 Practice of Simple Heat treatment processes like Tempering, Normalizing, and Hardening
	59.	4.4 Introduction to various heat treatment processes e.g annealing, hardening, tempering, normalizing
	60.	4.5 Description of various types of power hammers and their usage (Demonstration only)
11 th	61.	4.6 Jobs to be prepared
	62.	Job I To forge a square/hexagonal shape on both ends from a MS round by cold forging
	63.	Job II To make a utility item like fan hook, ring, U type door handle
	64.	Job III To make a ring of MS round by forge welding
	65.	Job IV To make a hexagonal chisel by hot forging process with hardening and tempering
	66.	Job V To perform bending process by hot forging
12 th	67.	5. ELECTRICAL AND ELECTRONICS SHOP - II
	68.	5.1 Safety Precautions of concerned shop and use of personal protective equipment (PPE), demonstration of tools, equipment, sample jobs, Best practices in the concerned shop
	69.	5.2 Introduction to single phase and three phase supply and wiring system. Importance of three phase supply (RYB) and its sequence and wiring system. Estimating and costing of power consumption
	70.	Job I Connecting single phase energy meter with supply and load. Reading and working of consumption and cost of energy.
	71.	5.3 Study of internal wiring diagram of common electrical appliances such as auto electric iron, electric kettle, ceiling/table fan, desert cooler etc. Demonstration of dismantling, servicing and reassembling of table/ceiling fan, air-cooler, auto electric iron, heater etc
	72.	Job II Connection of single phase/three phase motor by using starter. Reversing direction of rotation of single phase and three phase motors
13 th	73.	Job III Cut, bend, tin components, leads, inserts. Solder components for example resistor capacitor, diode, transistor and other components on a PCB
	74.	5.4 Demonstrate the joining for connecting methods mounting and dismounting method as well as using of the various plugs, sockets, conductors, suitable for general purpose, audio video used conductors, banana plugs, socket and similar male and female conductor and terminal strips
	75.	Copy checking
	76.	5.5 Various types of switches such as normal, miniature toggle, slide, push button.
	77.	Job IV Wiring of a small circuit on a PCB/ TAG strip involving laying, sleeving and use of id tags

	78.	Job V Cut, strip, join and insulate two lengths of wires/cables
14 th	79.	Desoldering practice with desoldering pump and desoldering wick
	80.	6. TURNING SHOP
	81.	6.1 Safety Precautions of concerned shop and use of personal protective equipment (PPE), demonstration of tools, equipment, sample jobs, best practices in the concerned shop
	82.	6.2 Jobs to be Prepared
	83.	Job 1 Centering practice in 4 jaw chuck, setting of cutting tool point at appropriate height perform facing and plain turning operations on MS rod
	84.	Job II To sharpen various angles of turning tool
15 th	85.	Job III To perform step turning on MS rod
	86.	Job IV To perform taper turning and under cutting operation.
	87.	Job V To perform step turning and knurling operation on MS rod
	88.	Copy checking/revision
	89.	Copy checking/revision
	90.	Copy checking/revision