Workshop Practice

Code	Credit Hours
ME-105	0-1

Course Description

Students are introduced to hands on training at different workshop sections like Machine shop, Welding and fabrication shop, Woodwork shop & pattern making, Bench fitting shop, Surface treatment shop, Electrical shop, Foundry and forging shop. The main objective of this course are:

1. To introduce basic manufacturing processes through workshop practices.
2. To apply the acquired knowledge in practice to manufacture products/components.
3. To inculcate teamwork through projects/tasks.

Textbook:

1. Introduction to Workshop Technology: Written by Engr. Muhammad Naweed Hassan

Reference Book:

1. Workshop Practice: Written by WA. J Chapman
2. Welding Technology: Written by Althouse

ASSESSMENT SYSTEM FOR LAB

Quiz	10%
Lab Work and Report	70%
Lab ESE/Viva	20%

TEACHING PLAN

S No	Shops / Labs	Lecture	Practical	Demo	Contact Hrs.
1.	**Introduction to Workshop Technology** a. Definitions and Terminologies b. Process of Manufacturing c. Industrial Safety d. Industrial Materials e. Manufacturing Standards f. Quality Control	---	---	1	1
2.	**Measuring Techniques** a. Measuring System / Standards b. Manufacturing Metrology c. Limits, Fits Allowances and Tolerances d. Measuring Instruments and their Uses	---.	1	--	2
3.	**Bench Fitting Practice** a. Fib and Tolerances b. Filling Work, Jigs and Fixtures, Taps and Die work c. Drilling and Grinding, Marking and Punching	---	1	---	3

4.	**Machining Practice (Lathe)** a. Types of Lathe Machines and Operations b. Cutting Tools, Accessories and Attachments c. Parts of lathe machines d. Safety Precautions	---	1	---	3
5.	**Machining Practice (Milling)** a. Types of milling Machines and Operations b. Cutting Tools, Accessories and Attachments c. Parts of Milling Machine d. Safety Precautions	---	1	---	3
6.	**Pattern Making / Wood Work** a. Introduction to wood and Classification b. Seasoning of Wood c. Engg application of wood d. Properties of wood and wood joints e. Pattern Making, Wood Defects f. Wood Working Tools and Machines	---	1	---	3
	Forging Work a. Forging Tools b. Hot and Cold Forging c. Properties and Crystals, Structure of Metals d. Forging Types / Operations e. Safety Precautions	---	1	---	2
8.	**Foundry Work** a. Introduction to Foundry b. Different methods of casting including latest techniques c. Different types of furnaces d. Mold and Die casting e. Casting defects f. Safety precautions	---	1	---	3
9.	**Electrical Technology** a. Basic Electrical Technology b. Power Supply Circuits, Types of Cables and Insulators c. Electrical Tools and Instruments d. Basic Fault Diagnosis in Circuits e. Electrical Devices f. Electrical Shock prevention and treatment g. Electrical Safety Precautions	---	2	---	3
10.	**Welding Technology** a. Introduction to Welding Theory b. Types of Welding, Welding Joints c. ARC Welding Techniques d. Gas Welding Techniques e. Safety Precautions	---	2	---	6

11.	**Surface Treatment** a. Electroplating Processes b. Electroplating Techniques c. Preparation of Work Piece (Degreasing and Pickling etc) d. Solution preparation for plating and their environmental issues	---	2	---	2
12	**Paint Work** a. Paints and application b. Primers and Solvents c. Types of paint d. Color combination	---	1	---	1
13	**Heat Treatment** a. Introduction to heat treatment b. Heat treatment cycle c. Heat treatment furnuses and their types d. Heat treatment process e.	---	1	---	1
14	**Term Project/Case Study/OEP/Practical Test**				6
TOTAL		**---**	**15**	**1**	**39**

Practical:

Experiment No	Description
1	Manufacturing of Adapter through turning process
2	Machining of a Nylon Plate through Milling Process.
3	Measuring Techniques and Instruments for dimensions of objects.
4	ARC Welding Practice by making various welding joints.
5	To make welding joints using gas welding.
6	Making a Pattern by Wood Working Basic Operations.
7	To prepare a sample of a metallic piece and carryout surface treatment through electroplating.
8	Introduction to bench fitting tools & instruments
9	To prepare a metal / non-metal with paint work.
10	Casting of Motorcycle Clutch and Brake Lever with Sand Casting Process.
11	Forging of a circular piece to a cuboid by upsetting process.
12	Common Single-Phase Circuit practice
13	Practice hand operation like Filling, Drilling, Tapping and Die Work.