Course Name: **Engineering Workshop**
Course Code: **ME-102**

Contact Hours/Week: **1L + 3P** Course Credits: **03**

Course Objectives

- To study the fundamentals and have practical exposure of basic manufacturing processes.
- To learn the basics of metal machining, welding, fitting, smithy, carpentry and foundry related operations.
- To understand and apply basic concepts of civil engineering materials, construction and study the different plumbing fittings.
- To familiarize students with various types of electrical tools, wiring schemes, safety measures, soldering and de-soldering of electronic circuits.
- To learn about operation and maintenance of domestic electrical appliances.

S.No.	Contents of Theory Part	Lectures
	Department of Mechanical Engineering	
1.	Importance of Engineering Workshop and description about each shop.	**01L**
2.	Brief Introduction of Engineering materials like Metals, Ceramics, Polymers and Composites.	**01L**
3.	Brief description of machining operations and study about construction and working of Lathe Machine.	**01L**
4.	Brief description of various joining processes. Brief description about Arc Welding and Gas Welding processes and their common applications.	**01L**
5.	Brief description about tools used in foundry shop and methods of preparation of Green Sand mould. Brief description of tools used in carpentry shop and introduction to different joints used in carpentry shop.	**01L**
6.	Brief description of various fitting operations and related tools.	**01L**
	Department of Civil Engineering	
7.	Introduction of Joinery details of plumbing fixtures for sanitary and water supply system	**01L**
8.	Types, quality and strength characteristics of various building materials: cement, sand, aggregates, bricks. Introduction to non-destructive testing.	**01L**
9.	Concept and detailing of reinforcement of various structural elements: beam, column, slab and footings/Types of Truss and its connection details.	**01L**
	Department of Electrical Engineering	
10.	Introduction to electrical tools, wires used and safety measures.	**01L**
11.	Concept of soldering and design aspects of regulated power supply.	**01L**
12.	Operation and maintenance of domestic electrical appliances.	**01L**

Practical No.	Contents of Practical
Mechanical Engineering Workshop	
1.	Preparation of job as per given drawing using Lathe Machine.
2.	Preparation of job as per given drawing using Arc/Gas Welding Setup.
3.	Preparation of Green Sand Mould using tools of Foundry Shop.
4.	Preparation of job as per drawing related to Joints used in Carpentry Shop using Carpentry Tools.
5.	Preparation of job as per given drawing related to Fitting Shop.
6.	Preparation of job as per given drawing of Bolts and Nuts using tools of Smithy Shop.
Civil Engineering Workshop	
7.	Assembly of conduit fittings: Elbow joining, T joining, Tap and pipe, Union and reducer, trap and sanitary pipe fitting.
8.	Testing of samples: cement–lump formation, sand–sieve analysis, aggregates–sieve analysis, bricks-Compressive strength. Preparation of cubes for testing of concrete.
9.	Assembly of reinforcement of beam, column, slab and footings with binding wire. Assembly of truss element with bolts and nuts.
Electrical Engineering Workshop	
10.	Wiring of fluorescent tube lamp for staircase lighting system.
11.	To assemble adjustable voltage power supply by soldering electronic components.
12.	To open, disconnect and re-connect internal wiring system of domestic electrical appliances.

Course Outcomes

Upon successful completion of the course, the students will be able to

CO1: Learn the basics of metal machining, welding, fitting, forging, carpentry and foundry related operations.
CO2: Learn the essential concepts of important pipe fitting operations.
CO3: Apply basic concepts related to plumbing, building materials and construction.
CO4: Execute the basic house hold wiring, electrical circuits and basic electronics appliances.
CO5: Identify and understand the functioning of common electrical appliances and their safe handling.
CO6: Develop the skill for soldering and de-soldering of electronic circuits.
CO7: Carry out repair and maintenance of electrical appliances.

Books and References

1. A Course in Workshop Technology by B.S. Raghuwanshi, DhanpatRai & Company(P) Limited.
2. Elements of Workshop Technology by Hajra Choudhary & Nirjhar Roy, Media Promoters and Publishers Pvt. Ltd.
3. Plumbing and Sanitary Engineering by J.B. Jindolia, Royal Publishers.
4. Building Materials by S.K. Duggal, New Age International. Publishers.
5. Electrical Wiring Estimating and Costing by S.L. Uppal & G.C. Garg Khanna Publication.
6. Basic Electronics by Mitchel Schultz McGraw Hill Education.
7. Electrical Appliances: The Complete Guide to the Maintenance and Repair of Domestic Electrical Appliances by Graham Dixon Haynes Publishing Group.