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22BEAS109 WORKSHOP TECHNOLOGY AND PRACTICES

Hours Per Week :

L	T	P	C
1	0	4	3

PREREQUISITE KNOWLEDGE:

COURSE DESCRIPTION AND OBJECTIVES:

The goal of this course is to impart knowledge and provide hands-on experience in Carpentry, Fitting, Facing and Turning. In addition, it also provides knowledge on various manufacturing processes such as Foundry, Welding, and Machine Shops.

MODULE-1

UNIT-1

4L+0T+16P=20 Hours

CARPENTRY TOOLS:

Introduction to various carpentry tools, materials, types of wood and their characteristics and Processes or operations in wood working; Introduction to Smithy tools and operations.

UNIT-2

4L+0T+16P=20 Hours

WELDING:

Introduction to welding, types of welding, Oxyacetylene gas welding, types of flames, welding techniques and equipment. Principle of arc welding, equipment and tools. Casting processes.

PRACTICES:

- Preparation of simple joints: Cross half Lap joint and T-Halving joint.
- Preparation of Dovetail joint, Mortise and tenon joint.
- Jobs on Bending, shaping etc.; Jobs on Drawing, Punching, Riveting.
- Introduction to tools and measuring instruments for fitting.
- Jobs on sawing, filing and right angle fitting of MS Flat.
- Practical in more complex fitting job.
- Operations of drilling, reaming, and threading with tap and dies.
- Introduction to tools and operations in sheet metal work.
- Making different types of sheet metal joints using G.I. sheets.
- Introduction to welding equipment, processes tools, their use and precautions.
- Jobs on ARC welding – Lap joint, butt joint; T-Joint and corner joint in Arc welding.
- Gas welding Practice – Lab, butt and T-Joints.

MODULE-2

UNIT-1

4L+0T+16P=20 Hours

LATHE:

Classification, constructional details of center lathe, Main accessories and attachments. Main operations and tools used on center lathes. Types of shapers, Constructional details of standard shaper. Work holding devices, shaper tools and main operations.

UNIT-2**4L+0T+16P=20 Hours****DRILLING MACHINES:**

Types of drilling machines. Constructional details of pillar types and radial drilling machines. Work holding and tool holding devices. Main operations. Twist drills, drill angles and sizes. Types and classification. Constructional details and principles of operation of column and knee type universal milling machines. Plain milling cutter. Main operations on milling machine.

PRACTICES:

- Introduction to metal casting equipment, tools and their use.
- Mould making using one-piece pattern and two pieces pattern.
- Demonstration of mould making using sweep pattern, and match plate patterns.
- Introduction to machine shop machines and tools.
- Demonstration on Processes in machining and use of measuring instruments.
- Practical jobs on simple turning, step turning.
- Practical job on taper turning, drilling and threading.
- Operations on shaper and planer, changing a round MS rod into square section on a shaper.
- Demonstration of important operations on a milling machine, making a plot, gear tooth forming and indexing; Any additional job.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply turning, facing, milling, drilling, threading, etc. in project work industry or other engineering works.	Apply	2	1, 2, 3, 4, 6
2	Apply and Fabricate wooden joints and joining of metals.	Create	1	1, 2, 3, 4, 6
3	Create the foundry shop, plant lay out and lathe machine.	Evaluate	1	1, 2, 3, 4, 7
4	Create, select and apply appropriate techniques, resources and modern engineering tools including prediction and modeling to complex engineering activities with an understanding of the limitations.	Create	2	1, 2, 3, 4, 6
5	Evaluate as a member or leader in diverse teams and in multi-disciplinary settings.	Evaluate	2	1, 2, 6, 7, 9

TEXT BOOK:

1. Hazra, Choudari S K and Bose S K. "Elements of Workshop technology" (Vol. I and II). Media Promoters and Publishers Pvt. Ltd., Mumbai, 2005.

REFERENCE BOOKS:

1. Chapman W A J. "Workshop Technology" (Part I and II). Arnold Publishers (India) Pvt. Ltd., AB/9 Safdarjung Enclave, New Delhi, 2002.
2. Raghuvamsi B S. "A Course in Workshop Technology" (Vol. I and II). Dhanpat Rai and Sons, 1682 Nai Darak, New Delhi, 2008.

SKILLS:

- ✓ Prepare wooden and metal furniture.
- ✓ Make funnels, trays, locker and steel almirahs etc.