

Subject Code: 2ET4000107	Subject Title: Mechanical Workshop Practice
Pre-Requisite	--

Course objectives:

1. Comprehend the need of various sections in a workshop
2. Demonstrate observance of the safety consciousness and good housekeeping in a workshop
3. Follow the standard procedure for workshop practice.
4. Select and use appropriate materials for various sections of a workshop.
5. Use various tools, instruments and machines for different operations in fitting, smithy, carpentry, pipefitting and metal joining shop.
6. Prepare the required jobs correctly according to given specification in various sections of a workshop as mentioned in 5.

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)			
Lecture	Tutorial	Practical	Credit	Theory		Practical	
				University Assessment	Continuous Assessment	University Assessment	Continuous assessment
-	-	2	1	--	--	--	50

Course contents:

SR.NO	TOPIC	TUTORIAL HOUR	PRACTICAL HOUR
1.	Introduction to Workshop Introduction to Workshop Workshop layout, Importance of various shops of workshop, type of jobs done in each shop. General Safety aspects in various industries such as process industries, automotive industries, power plant , Oil Industries, Electrical Industries etc. Personal safety, Use of tools, Workshop cleanliness, Fire precautions	-	02
2.	Carpentry: i) Demonstration of different wood working tools / machines. ii) Demonstration of different wood working processes, like planing, marking, chiseling, grooving, turning of wood etc. iii) One simple job involving any one joint like mortise and tenon dovetail, bridle, half lap etc.	-	06

3.	Fitting: i) Demonstration of different fitting tools and drilling machines and power tools ii) Demonstration of different operations like chipping, filing, drilling, tapping, sawing, cutting etc. iii) One simple fitting job involving practice of chipping, filing, drilling, tapping, cutting etc	-	08
4.	Welding: i) Demonstration of different welding tools / machines. ii) Demonstration on Arc Welding, Gas Welding, MIG, MAG welding, gas cutting and rebuilding of broken parts with welding. iii) One simple job involving butt and lap joint	-	02
5.	Sheet Metal Working: i) Demonstration of different sheet metal tools / machines. ii) Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering, brazing, and riveting. iii) One simple job involving sheet metal operations and soldering and riveting.	-	02
6.	Electrical House Wiring: Practice on simple lamp circuits (i) one lamp controlled by one switch by surface conduit wiring, (ii) Lamp circuits- connection of lamp and socket by separate switches, (iii) Connection of Fluorescent lamp/tube light, (iv) simple lamp circuits-install bedroom lighting. And (v) Simple lamp circuits- install stair case wiring.	-	04
7.	Demonstration: i) Demonstration of measurement of Current, Voltage, Power and Energy. ii) Demonstration of advance power tools, pneumatic tools, electrical wiring tools and accessories. iii) Tools for Cutting and drilling	-	04

LIST OF EXERCISES

(1) CARPENTRY

Prepare one job on marking, planning, sawing, chiseling and joining. Prepare one job on marking, sawing, planning, nailing and screwing using plywood/packing wood.

(2) FITTING

Prepare one job on marking, drilling filing and tapping generating different profiles such as pentagon, hexagon etc. Prepare one job on male female fitting.

(3) WELDING

Prepare one job using arc welding.

(4) SHEET METAL

Prepare one job on sheet metal marking, shearing, flattening, bending and joining

(5) ELECTRICAL HOUSE WIRING

Practice on simple lamp circuits

(6) Demonstration

Demonstration of measurement of Current, Voltage, Power, Energy, advance power tools, pneumatic tools, electrical wiring tools and accessories.

Course outcomes:

The practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

- Acquire skills in basic engineering practice to identify, select and use various marking, measuring, and holding, striking and cutting tools & equipment's and machines
- Understand job drawing and complete jobs as per specifications in allotted time
- Inspect the job for the desired dimensions and shape
- Operate, control different machines and equipment's adopting safety practices

SOFTWARE/LEARNING WEBSITES

- <http://www.abmtools.com/downloads/Woodworking%20Carpentry%20Tools.pdf>
- <http://www.weldingtechnology.org>
- <http://www.newagepublishers.com/samplechapter/001469.pdf>
- <http://www.youtube.com/watch?v=QHF0sNHnttw&feature=related>
- <http://www.youtube.com/watch?v=Kv1zo9CAxt4&feature=relmfu>
- <http://www.piehtoolco.com>

References:

1. Workshop Familiarization E. Wilkinson
2. Workshop Technology - I Hazra and Choudhary
3. Workshop Technology - I W.A.J. Chapman
4. Sheet metal shop practice Bruce & Meyer
5. Workshop Technology Vol. I & II Gupta & Kaushik

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Use the preliminary safety measures while working in different shops of engineering workshops.	1 Remembering 2 Understanding 3 Applying
CLO2	Select the appropriate tools/equipment required for a specific job.	1 Remembering 2 Understanding 3 Applying
CLO3	Perform various fitting and sheet metal operations to produce simple jobs.	1 Remembering 2 Understanding 3 Applying
CLO4	Perform various Smithy operations to produce simple jobs.	1 Remembering 2 Understanding 3 Applying
CLO5	Use various tools for performing plumbing and carpentry operations.	1 Remembering 2 Understanding 3 Applying
CLO6	Perform various joining operations using welding, brazing and soldering methods.	1 Remembering 2 Understanding 3 Applying

Course Learning Outcomes	Program Outcomes (Pos)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO1	H		L		L				H			H	H	L	H
CLO2	H		H		H		M	H	H	M		H	H	L	H
CLO3	H		H		H		M	H	H	M		H	H	L	H
CLO4	H		H		H		M	H	H	M		H	H	L	H
CLO5	H		H		H		M	H	H	M		H	H	L	H
CLO6	H		H		H		M	H	H	M		H	H	L	H

H:High, M:Medium, L:Low