

<b>Name of Faculty</b>	:	Faculty of Engineering & Technology
<b>Name of Program</b>	:	Diploma Engineering (DE)
<b>Course Code</b>	:	1DME02
<b>Course Title</b>	:	Engineering Workshop
<b>Type of Course</b>	:	Basic Engineering (BE)
<b>Year of Introduction</b>	:	2023-24

<b>Prerequisite</b>	:	Zeal to learn the subject.
<b>Course Objective</b>	:	Understand the basic tool which is used in engineering course which is in all engineering branch.
<b>Course Outcomes</b>	:	At the end of this course, students will be able to:
	CO1	To <b>Remember</b> the preliminary safety measures while working in different shops of engineering workshop.
	CO2	To <b>Understand</b> the Study and practice on machine tools and their operations.
	CO3	To find the <b>Applications</b> of the appropriate tools/equipment required for specific job.
	CO4	TO <b>Analyse</b> various operation to produce different jobs.
CO5	To <b>Understand</b> various joining operations using welding, brazing and soldering methods.	

#### Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
L	T	P		Theory Marks		Practical Marks		Total Marks
			C	SEE	CIA	SEE	CIA	
2	0	4	4	70	30	30	20	150

*Legends: L-Lecture; T-Tutorial/Teacher Guided Theory Practice; P-Practical – Credit, SEE – Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

#### Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with COs
1	<b>WORK SHOP INTRODUCTION &amp; SAFETY:</b> <ul style="list-style-type: none"> <li>Workshop layout</li> <li>Importance of different sections/shops of workshop</li> <li>Introduction to workshop safety</li> <li>Personal safety</li> <li>Use of tools</li> <li>Workshop cleanliness</li> </ul>	04	14%	CO1



2	<b>CARPENTRY SHOP:</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Advantages of timber</li><li>• Structure of wood</li><li>• Selection of timber</li><li>• Carpentry tools</li><li>• Cutting tools, Planes and Boring tools etc</li><li>• Preparation of carpentry job</li></ul>	06	20%	CO1 CO3
3	<b>FITTING SHOP:</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Fitting tools:<ul style="list-style-type: none"><li>i) Holding tools,</li><li>ii) Striking tools,</li><li>iii) Cutting tools,</li><li>iv) Measuring, Marking and Testing tools etc.</li></ul></li><li>• Fitting operations:<ul style="list-style-type: none"><li>i) Method of filing,</li><li>ii) Marking,</li><li>iii) Sawing,</li><li>iv) Chipping etc.</li></ul></li><li>• Materials used in fitting shop</li><li>• Preparation of fitting job</li></ul>	06	20%	CO1 CO2 CO3 CO4
4	<b>WELDING SHOP:</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Types of welding</li><li>• Arc welding:<ul style="list-style-type: none"><li>i) Principle of arc welding,</li><li>ii) Electric arc welding</li></ul></li><li>• Arc welding electrodes</li><li>• Fluxes</li><li>• Equipment's used in arc welding</li><li>• Types of welded joints</li><li>• Comparison between AC and DC welding</li><li>• Preparation of work before welding</li><li>• Advantages of welding</li><li>• Disadvantages of welding</li><li>• Common welding defects</li><li>• Preparation of welding job</li></ul>	06	20%	CO1 CO2 CO3 CO5
5	<b>SHEET METAL SHOP:</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Metals used in sheet metal work</li><li>• Hand tools</li><li>• Sheet metal joints</li><li>• Soldering</li><li>• Brazing</li></ul>	04	13%	CO1 CO3 CO4

6	<b>PLUMBING SHOP:</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Types of pipes</li> <li>• Pipe fittings including valves</li> <li>• Plumbing tools</li> <li>• Pipe joints</li> <li>• Preparation of plumbing job</li> </ul>	04	13%	CO1 CO3 CO5
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Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
<b>Weightage</b>	20	40	20	20	00	00

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

#### Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	To make a general Layout of Workshop.	02
2	Introduction to various basic machine tools used in workshop and safety equipment.	02
3	<b>Carpentry shop-1</b> Introduction different carpentry tools. Prepare report on this with various specification, application and sketch. Prepare a simple job as per drawing suggested by teacher using various operations like measuring, cutting, marking and assembly.	06
4	<b>Carpentry shop-2</b> Prepare following carpentry job as per given drawing: <ul style="list-style-type: none"> <li>• T-Joint,</li> <li>• Dovetail Joint</li> </ul>	06
5	<b>Fitting shop-1</b> Demonstrate different equipment use for this shop. Prepare report on this with various specification, application and sketch. Prepare one simple fitting job with following operations <ul style="list-style-type: none"> <li>• Marking operation as per drawing</li> <li>• punching operation as per drawing</li> <li>• filing operation as per drawing.</li> </ul>	02
6	<b>Fitting shop-2</b> Prepare job with following operations: <ul style="list-style-type: none"> <li>• chamfering operation as per drawing</li> <li>• sawing operation as per drawing</li> </ul>	08



7	<b>Fitting shop-2</b> Prepare job with following operations: • drilling operation as per drawing • tapping operation as per drawing	08
8	<b>Welding shop-1</b> Demonstrate different welding tools and types of welding machine. Prepare report on this with various specification, application and sketch. Prepare a simple job using <b>Arc welding machine</b> .	06
9	<b>Welding shop-2</b> Demonstrate different welding tools of Gas welding machine. Prepare report on this with various specification, application and sketch. To study about <b>Gas welding</b> .	02
10	<b>Sheet Metal shop-1</b> Study about various joining operation like soldering, brazing, riveting etc. Demonstrate various equipments use for this shop. Prepare report on this with various specification, application and sketch.	04
11	<b>Sheet Metal shop-2</b> Prepare a one simple sheet metal job as per drawing suggested by teacher by following operation. <ul style="list-style-type: none"> <li>• Cutting</li> <li>• Edging</li> <li>• Bending</li> </ul>	06
12	<b>Plumbing shop-1</b> Demonstration of different plumbing tools and pipe fittings. Prepare the report with sketch, specifications and applications of demonstrated plumbing tools and pipe fittings.	04
13	<b>Plumbing shop-2</b> Prepare following plumbing job as per given drawing: <ul style="list-style-type: none"> <li>• T joint pipe fitting job</li> <li>• elbow joint pipe fitting</li> </ul>	04

#### Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Steel rule 24" Measuring Tape 300 mm. C clamps, Tri square, Right angle, Compass and divider, Set of chisels Ball pane Hammer - 750 Gms. Hardware- nails, screws etc. Set of screw drivers, Wood work punches Carpentry vices, Bar cramp Plane machine-small ("Randha machine") Wood and metal Jack planes- 45 mm.
2	Bench vices, marking table, Surface plate, Angle plate, Tri square, Right angle Combination set, Ball pane Hammer - 750 Gms. Pair of outside spring calliper- 250 mm. Pair of Inside spring callipers 150 mm.

	Vernier calliper, Micrometer outside & inside Files (smooth & rough)-round, flat, safe edge, square, knife edge, triangular, half round One pair of divider Hacksaw frame with blade 12"* 300 mm. Centre punch
3	Arc welding set with necessary accessories, Welding cables, Electrodes, Fluxes, Electrode holders, Ground clamps, Chipping hammer, Wire brush, Try Square Hammers, tongs, chisels and anvil Screw, Wrench Tip Cleaner, Swage block and Personal Protective Equipment like safety gloves, face shield /screen etc.
4	Rubber mallet Sheet Metal Shop Wooden mallet Slip 12", 10" Slip ordinary Half moon stake, Side stake, Exiting stake, Cross stake, Funnel stake, Tea & bottom stake Stake holding stand, Combination pliers, S.W.G Hand riveting, m/c Spinning hath 6' with die, Power hydraulic press m/c, Riveting m/c, Round stake, Soldering etc
5	Various samples of pipe fittings-like joints, elbows, tees, unions, bend, nipples, couplers, reducers, four way etc. of Metal and PVC. Water taps, plug, ferule Pipe bending machine manual/hydraulic Pipe vice Pipe wrenches Pipe spanners Set of spanners-Fix, Ring, box, Allen and Adjustable. Set of screw drivers-sorted Set of chisels, Hammers Teflon taps, cotton thread Set of dies and holders Hacksaw, pipe cutter Adhesive for PVC pipe fittings etc.

#### Suggested Learning Websites

Sr. No.	Name of Website
1	<a href="http://www.weldingtechnology.org">www.weldingtechnology.org</a>
2	<a href="http://www.abmtools.com/downloads/Woodworking%20Carpentry%20Tools.pdf">www.abmtools.com/downloads/Woodworking%20Carpentry%20Tools.pdf</a>
3	<a href="http://www.nptel.ac.in">www.nptel.ac.in</a>

#### Reference Books

Sr. No.	Name of Reference Books
1	Workshop Practice by H.S. Bawa, McGraw Hill Education, Noida
2	A Textbook of Manufacturing Process by J.K.Gupt and R.S. Kurmi, S.Chand and Co. New Delhi
3	Introduction to Basic Manufacturing Process and Workshop Technology by Rajender Singh, New Age International, New Delhi