B.Tech.	1	Semester	1/2	Teaching Scheme				Evaluation Scheme	
Subject Name	Mechanical Engineering Workshop			**L**	**T**	**P**	**Credits**	**CCE**	**SEE**
Subject Code	BTME22106			-	-	2	1	25	25
Type of course	Engineering Science Course (ESC)			CCE : Continuous and Comprehensive Evaluation SEE : Semester End Evaluation					
Prerequisite	No prerequisites								
Rationale	This course focuses on essential mechanical workshop practices, equipping students with practical skills in machining, fabrication, joining, and material processing, which are fundamental to mechanical engineering.								

Course Outcomes (COs): At the end of the course, students will be able to		**Marks % Weightage**
CO-1	Identify and use basic workshop tools and equipment.	20
CO-2	Explain fundamental fabrication and joining processes.	20
CO-3	Practice machining operations using machine tools.	15
CO-4	Examine pipe fitting, hydraulic, and pneumatic system assembly.	10
CO-5	Develop skill to disassemble and assemble general mechanical components.	15
CO-6	Create practical applications of sheet metal work operations.	20

Course Contents

Unit	**Content**	**Tentative Teaching Hours**
1.	**Introduction to Workshop Practices:** Importance of mechanical workshop in engineering applications, general safety norms and use of personal protective equipment (PPE), introduction to measuring, marking, cutting, and holding tools.	2
2.	**Machine Tools:** Introduction to machining: lathe, drilling, Shaper and milling machines.	6

Unit	Content	Tentative Teaching Hours
3.	**Welding and Joining Techniques:** Introduction fusion welding, brazing and soldering. Mechanical joining methods: rivets, and adhesive bonding. Fabricating simple welded and assembled structures.	6
4.	**Sheet Metal and Structural Fabrication:** Sheet metal cutting, bending, and joining processes, Types of sheet metal joints and their applications, Fabrication of simple enclosures, ducts, and brackets.	6
5.	**Pipe Fitting and Insulation Techniques:** Types of pipes, materials, and advanced pipe-fitting techniques, pipe bending, flaring, and joining methods (threaded, welded, grooved), insulation techniques for piping systems in mechanical industries.	2
6.	**Hydraulic and Pneumatic System:** Introduction to hydraulic and pneumatic components, assembly and testing of simple hydraulic and pneumatic circuits, applications in mechanical engineering.	2
7.	**Assembly and Disassembly of Mechanical Components:** Introduction to mechanical assemblies – fasteners, bearings, gears, shafts. Hands-on disassembly and reassembly of basic mechanical systems (e.g., gearboxes, pumps, engines). Importance of alignment, lubrication, and maintenance in mechanical systems, practical exposure to hand tools and precision instruments used in assembly.	6

List of Practicals:

1. Workshop Safety and Tool Identification: Introduction to safety norms, PPE, and basic tools.
2. Demonstration of Lathe Machine (Turning Operation).
3. Demonstration of Radial Drilling Machine.
4. Demonstration of Milling Machine (Facing Operation).
5. Welding and Joining Practice: gas welding, brazing and mechanical joining (rivets)
6. Sheet Metal Work and Fabrication: Cutting, bending, and assembling sheet metal components.
7. Hydraulic and Pneumatic Systems: Assembling and testing simple hydraulic and pneumatic circuits.
8. Assembly and Disassembly Practice: Hands-on disassembly and reassembly of machine components such as bearings, shafts, gears, or small engines.

Suggested Specification Table of Marks as per Revised Bloom's Taxonomy					
% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	40	0	0	20

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate, **C:** Create and above Levels

Recommended Reference Books

1. Veeranna D. Kenchakkanavar, Workshop / Manufacturing Practices, Khanna Book Publishing, 2021.
2. Raghuvanshi B.S, Workshop Technology Vol. 1 and 2, Dhanpat Rai & Sons, 2015.
3. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., Elements of Workshop Technology, Vol. I and II, Media promoters and publishers private limited, 2008 and 2010.
4. W A J Chapman, Workshop Technology 1, CBS, New Delhi, 2001.
5. H S Bawa, Workshop Practices, Tata McGraw-Hil, 2001.

Mapping of Course Outcomes (CO's) with Program Outcomes (PO's)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	3	2	2	1	1	2	1	2	3	3	1	3
CO-2	3	3	2	2	1	1	2	1	3	3	2	2
CO-3	3	2	2	1	2	2	1	1	2	1	1	3
CO-4	2	1	1	1	1	2	1	1	2	1	1	1
CO-5	2	2	2	1	1	2	1	2	2	-	1	3
CO-6	2	2	1	2	1	1	2	1	2	1	2	3

Major Equipment and Accessories

Workbenches and Vices, Measuring Instruments, Hand and Power Tools, Welding Machines – Arc welding and gas welding, Sheet Metal Tools, Pipe Cutting and Threading Tools, Lathe Machine, Drilling Machine, Milling Machine, Hydraulic and Pneumatic Kits, Structural Fabrication Tools.