

**Subject Code: 01ME1104**
**Subject Name: Mechanical Workshop**
**B.Tech. I<sup>st</sup> Year Semester: II**
**Type of course:** Under Graduate

**Prerequisite:** Zeal to learn subject

**Rationale:** Mechanical Workshop is of paramount importance for the engineering students to enhance their technical skills as per the need of industries. Practice of engineering workshop make students aware about practical work in industrial environment as well as day-to-day life work.

### **Course Outcome:**

After learning the course, the students will be competent to

1. Apply knowledge of hand tools, power tools and safety related rules and regulations
2. Apply knowledge of conventional machining processes
3. Apply knowledge of advanced manufacturing processes
4. Apply knowledge of manufacturing processes of composite materials

### **Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Teaching Scheme (Hours)					Total Marks		
Theory	Theory	Theory		Theory Marks			Practical Marks				
				ESE(E)	IA	CSE	Viva (V)	Term Work (TW)			
0	0	2	1	0	0	0	0	50	50		

### **Content:**

Sr. No.	Content	Total Hrs.
1	<p><b>Introduction:</b> Introduction to mechanical workshop its plan and layout. Learn about various safety related rules and regulation.</p> <p>Demonstration of various tools which are used in workshop like hand tools, power tools, various measurement equipment, study of different types of materials, various processes like Finishing, Marking, Cutting, Smoothening, Bending etc.</p>	04

<b>2</b>	<b>Fitting Shop and Carpentry Shop</b> Demonstration of fitting and carpentry job and make job physically	<b>08</b>
<b>3</b>	<b>Metal Removing Operations</b> Introduction to Lathe machine, Various parts of Lathe machine, Various operations on lathe machine	<b>04</b>
<b>4</b>	<b>Laser Cutting Operation</b> Introduction to 2D CAD drawing, exporting 2D drawing to software, Principle of Laser cutting machine, Demonstration of laser cutting operation.	<b>04</b>
<b>5</b>	<b>Additive Manufacturing</b> Introduction to Additive Manufacturing, use of 3D models in additive manufacturing, demonstration of 3D printing process	<b>04</b>
<b>6</b>	<b>Manufacturing of composite materials</b> Introduction to composite materials, different manufacturing methods of composite materials, materials used for manufacturing of composite materials, GFRP manufacturing	<b>04</b>

**List of Experiments:**

1. Fitting job and Carpentry job
2. Metal removing operations on lathe machine
3. Laser cutting operation
4. Manufacturing of prototype using 3D printer
5. Manufacturing of GFRP composite

**Major Equipment:**

1. Hand tools and Power tools
2. Bench vise
3. Lathe machine
4. Laser cutting machine
5. 3D printer

**Reference books:**

1. Elements of Workshop Technology, Volume-2: Machine Tools, S.K. Hajra Choudhury, Nirjhar Roy, MPP Publication
2. The Laser Cutting Process: Analysis and Applications, Bekir Sami Yilbas, Elsevier Publication
3. Additive Manufacturing Technologies: 3D Printing, Rapid Prototyping and Direct Digital Manufacturing, Ian Gibson, David Rosen, Brent Stucker, Springer

4. Composite Materials: Science and Engineering, Krishan K Chawla, Springer

**List of Open Base Software / learning website:**

1. NPTEL Courses