

Title of the course  
Sub Code

: Workshop Technology and Practice  
: ESME – 402

L	T	P	Credits	Weekly Load
1	0	0	1	1

**COURSE OUTCOMES:**

After successful completion of course, the students should be able to

- CO1: Learn basic concepts of workshop technology.  
 CO2: Learn about different hand tools and their safe applications in fitting, sheet metal, carpentry shop.  
 CO3: Learn about different machines and tools and their safe applications in machine, welding and forging shop.  
 CO4: Familiarize with different tools, patterns and moulds used in foundry shop.  
 CO5: Apply workshop practices in engineering applications.

CO/PO Mapping: ( Strong(3) / Medium(2) / Weak(1) indicates strength of correlation):

COs	Programme Outcomes (POs)												Programme Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	1	1	1	3	1	1	1	1	1	-	1	1	1	1
CO2	2	1	1	1	3	1	1	1	1	1	-	1	1	1	1
CO3	2	1	1	1	3	1	1	1	1	1	-	2	2	2	1
CO4	2	1	1	1	3	2	1	1	1	1	1	2	2	2	2
CO5	3	2	1	1	2	1	1	1	1	1	1	2	2	2	2
Avg.	2.2	1.2	1	1	2.8	1.2	1	1	1	1	0.4	1.6	1.6	1.6	1.4

**Theory**

Unit	Main Topics	Course outlines	Lecture(s)
Unit-1	Fitting	Introduction to the tools used in fitting shop, Operations like marking, sawing, filing, chipping, scrapping, drilling etc.;	02
	Sheet Metal	Introduction to sheet metal work; GI sheets, Hand tools used in sheet metal shop, Operations -shearing, bending, drawing, squeezing etc.	02
	Carpentry	Introduction to wood working, types of wood, seasoning methods, Various joints.	02
	Pattern Making	Introduction of pattern, types and pattern materials, pattern allowances.	02
Unit-2	Foundry	Introduction to casting process, properties of moulding sand, mould boxes, moulding, gating system and pouring.	02
	Forging	Introduction to forging, hand tools and equipment used, cold and hot forging, forging operations.	02
	Machining	Introduction of various parts of lathe, specifications of lathe, single point cutting tool, tool materials, various operations that can be performed on a lathe.	02
	Welding	Definition of welding, gas and arc welding, electrode used, introduction to soldering and brazing.	02

Total: 16

**Recommended Books:**

- Hajra Choudhury, Hazra Choudhary and Nirjhar Roy, 2007, Elements of Workshop Technology, vol. I, Media promoters and Publishers Pvt. Ltd.
- W A J Chapman, Workshop Technology, 1998, Part -1, 1st South Asian Edition, Viva Book Pvt Ltd.
- P.N. Rao, 2009, Manufacturing Technology, Vol.1, 3rd Ed., Tata McGraw Hill Publishing Company.
- Kaushish J.P., Manufacturing Processes, 2008, Prentice Hall India

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Title of the course : Workshop Technology and Practice Lab

Subject Code : ESME-405

L	T	P	Credits	Weekly Load
0	0	4	2	4

**COURSE OUT COMES:**

After successful completion of course, the students should be able to

- CO1: Adopt safety precautions while doing practical training in various workshops.
- CO2: Familiarization with various hand tools and equipments in different workshops.
- CO3: Select and use different hand tools for particular application.
- CO4: Understand the mechanism of various machines and equipments to operate the same.
- CO5: Apply workshop practices in engineering and industrial applications.

CO/PO Mapping: (Strong(3) / Medium(2) / Weak (1) indicates strength of correlation):

COs	Programme Outcomes(POs)												Programme Specific Outcomes		
	PO1	PO2	PO3	PO4	PO2	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	1	1	2	1	3	1	2	1	2	1	1	2	2	1	2
CO2	2	1	2	1	3	1	2	1	2	1	2	2	1	1	2
CO3	2	1	3	1	3	2	1	1	2	1	2	2	-	2	1
CO4	3	2	1	1	3	2	1	1	2	1	2	2	2	1	2
CO5	3	2	2	2	2	2	1	1	2	1	2	2	-	2	1
Avg.	2.2	1.4	2.0	1.2	2.8	1.6	1.4	1.0	2.0	1.0	1.8	2.0	1.0	1.4	1.6

**List of Practical's (10-14) jobs from the following list:**

**CARPENTRY SHOP**

- Making of various joints
- Cross lap joint
- T-lap joint
- Dove tail joint

**FITTING SHOP**

- Study and use of instruments/equipments and machines available in fitting shop.
- Exercise on simple operations viz. cutting, sawing, filing, drilling etc.

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### **FOUNDRY SHOP**

- Familiarization with different types of patterns and hand tools.
- Preparations of green sand mould using single piece pattern.
- Preparations of green sand mould using split piece pattern on bench molding.

### **PATTERN SHOP**

- Familiarization with different tools and patterns in the shop
- Exercise on making of solid piece pattern.
- Exercise on making of split piece pattern.

### **SHEET METAL SHOP**

- Familiarization with different tools and processes in sheet metal shop.
- Exercise on cutting, development, folding, bending, etc.
- Preparation of various joints.

### **WELDING SHOP**

- Introduction of various tools and machines.
- Laying a bead on plate.
- Practice of soldering.
- Practice of brazing.

### **FORGING SHOP**

- Familiarization with different tools used.
- Making a circular ring from square rod.
- Making an Allen key circular ring from square rod.

### **MACHINE SHOP**

- Familiarization with safety aspect.
- To Familiarization with equipment and tools.
- Practice of facing operation on lathe.
- Practice of turning operation on lathe machine.

AS KVL  
Able