



Course Title: Elements of Mechanical Engineering Lab
Course Level: UG

Credit Units: 01
Course Code: ES 102

L	T	P/S	SW/F W	TOTAL CREDIT UNITS
-	-	2	-	1

Course Objectives: This subject gives a very primitive but general information finding wide application in day to day life with emphasis upon the principles and fundamentals involved in various operations and processes used in manufacturing. The subject also offers a birds eye-view to all students about the common engineering materials finding wide application in Mechanical Engineering Industry and about their strength and other related vital aspects.

Pre-requisites: No pre-requisites required

Student Learning Outcomes:

On completion of the course the student will be able to:

1. Identify a broad range of materials used in mechanical engineering processes
2. List the different characteristics of metals used in mechanical engineering processes
3. Describe how hard and soft metals are selectively used in mechanical engineering processes
4. Follow a drawing or sketch for a specified mechanical engineering task
5. Carry out specified bench work activities using hand and power tools
6. Measure and mark out various geometric shapes accurately onto metal
7. Ability to do arc and welding and make different types of joints.
8. Ability to make sand moulds and patterns for casting process
9. Apply appropriate health, safety and personal hygiene procedures when performing mechanical engineering tasks
10. Demonstrate the application of communications, team working and quality awareness in an engineering environment.

Pedagogy for Course Delivery:

The course pedagogy will include lectures and practical performance of various jobs.

Lab/ Practicals details, if applicable:

List of Experiments:

- To make a two side square piece from a rectangular plate.
- To make a male female joint from a rectangular plate.
- To make a dust bin from zinc coated iron sheet.
- To make a funnel of a zinc coated iron sheet
- To make a cylindrical mug with handle of zinc coated iron sheet.
- To make a two side square piece from rectangular plate for Welding.
- To make a Butt joint, Lap joint and T- joint with the help of Arc- Welding.
- To make a Butt joint, Lap joint and T- joint with the help of Gas Welding.
- To make a mould casting by single piece pattern and split pattern bracket with cores.
- To make a mould casting by double piece pattern with pulley block.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total
Nil	100%	100%

Lab/ Practical/ Studio Assessment:

Components (Drop down)	Continuous Assessment/Internal Assessment				End Term Examination	
	A	PR	LR	V	PR	V
Weightage (%)	5	10	10	5	35	35

Text & References:

Text Books:

1. Welding Technology by R.S. Parmar, Khanna Publishers.
2. Thermodynamics and Heat Engines Volume-I, by R. Yadav: Central Publications.
3. Ganesan, V. Internal Combustion Engine, Tata McGraw-Hill.
4. Mathur, M.L. and Sharma, R.P. Internal Combustion Engine. Dhanpat Rai Publication

Reference Books:

Heine, R.W. C.R. Loper and P.C. Rosenthal, Principles of metal casting McGraw Hill