SCHEME OF COURSE WORK

Course Details:

Course Title	**:** ADVANCED WELDING LAB		
Course Code	**:** 22ME11S2	**L T P C**	**: 1 0 2 2**
Program:	**: B. Tech.**		
Specialization:	**: Mechanical Engineering**		
Semester	**: IV**		

Course Outcomes (COs): The student will be able to

CO1:	use oxy-fuel welding machine for gas cutting and welding
CO2:	demonstrate MMAW machine in different positions for welding joints
CO3:	use GMAW machine in different positions for welding joints
CO4:	demonstrate GTAW machine in different positions for welding joints
CO5:	illustrate simulation of MMAW, GMAW and GTAW

Program Outcomes (POs): A graduate of mechanical engineering will be able to

PO-1	Apply the knowledge of mathematics, science, engineering fundamentals to solve complex mechanical engineering problems.
PO-2	Attain the capability to identify, formulate and analyse problems related to mechanical engineering.
PO-3	Design solutions for mechanical system components and processes that meet the specified needs with appropriate consideration for public health and safety.
PO-4	Perform analysis, conduct experiments and interpret data by using research methods such as design of experiments to synthesize the information and to provide valid conclusions..
PO-5	Select and apply appropriate techniques from the available resources and current mechanical engineering and software tools.
PO-6	Carry out their professional practice in mechanical engineering by appropriately considering and weighing the issues related to society.
PO-7	Understand the impact of the professional engineering solutions on environmental safety and legal issues.
PO-8	Transform into responsible citizens by resorting to professional ethics and norms of the engineering practice.
PO-9	Function effectively in individual capacity as well as a member in diverse teams and in multidisciplinary streams.
PO-10	Communicate fluently with the engineering community and society, and will be able to prepare reports and make presentations effectively.
PO-11	Apply knowledge of the engineering and management principles to managing projects and finance in multidisciplinary environments.

PO-12	Engage themselves in independent and life-long learning to continuing professional practice in their specialized areas of mechanical engineering.

Course Outcome Versus **Program Outcomes:**

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

3 - Strongly correlated, *2* - *Moderately* correlated, *Blank* - *No correlation*

Program Specific Objectives (PSOs):

The student must attain the knowledge and skills to

PSO-1	Design, analyse and optimize mechanical systems along with control mechanisms
PSO-2	Manufacture mechanical components by selecting effective processing methods and efficient tools
PSO-3	Design, analyse and evaluate thermal systems

Course Outcome Versus Program Specific Outcomes:

COs	PSO1	PSO2	PSO3
CO-1		2	
CO-2		2	
CO-3		2	
CO-4		2	
CO-5		2	

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), put -: No Correlation

Assessment Methods:	End Exam

Teaching-Learning and Evaluation

Week	Contents	Course Outcomes	Sample Viva Questions	Teaching Learning Strategy	Assessment Method & Schedule
1	**Introduction to all experimental setup**				

2	**Experiment -1** OXY-FUELGAS CUTTING – Straight Line Bevel Cutting	CO - 1	1. Mention types of flames used in gas cutting.	Lecturing Demonstration and conducting experiments	End Exam
3	**Experiment -1** OXY-FUELGAS CUTTING - Bevel Cutting	CO - 1	1.What is Oxidizing flame??	Lecturing Demonstration and conducting experiments	End Exam
4	**Experiment -2** OXY-FUELGAS WELDING Preparation of straight line beads with filler wire	CO - 1	1.How do you differentiate gas cutting and gas welding in terms of nozzle?	Lecturing Demonstration and conducting experiments	End Exam
5	**Experiment -2** OXY-FUEL GAS WELDING – Preparation of straight line beads with filler wire	CO - 1	1.What kind of fuel gas is commonly used in gas welding?	Lecturing Demonstration and conducting experiments	End Exam
6	**Experiment -5** MANUAL METAL ARC WELDING – Preparation of Butt joint in Flat Position	CO - 2	1.What is the principle of Arc Welding?	Lecturing Demonstration and conducting experiments	End Exam
7	**Experiment -6** MANUAL METAL ARC WELDING – Preparation of Lap joint in Horizontal Position	CO – 2	1.What is the full form of MMAW?	Lecturing Demonstration and conducting experiments	End Exam
8	**Experiment -7** MANUAL METAL ARC WELDING – Preparation of T joint in Vertical Position	CO - 2	1.Mention different welding positions	Lecturing Demonstration and conducting experiments	End Exam
9	**Experiment -8** GAS METAL ARC WELDING Preparation of T joint in Flat Position	CO - 3	1.What is other name for GMAW?	Lecturing Demonstration and conducting experiments	End Exam
10	**Experiment -9** GAS METAL ARC WELDING Preparation of Butt joint in Horizontal Position	CO - 3	1.What is the full form of GMAW?	Lecturing Demonstration and conducting experiments	End Exam

11	**Experiment -10** GAS METAL ARC WELDING Preparation of Lap joint in Vertical Position	CO - 3	1.What is the difference between MIG and TIG welding.	Lecturing Demonstration and conducting experiments	End Exam
12	**Experiment -11** GAS TUNGSTEN ARC WELDING – Preparation of Lap joint in Flat Position	CO - 4	1.Which type of electrode is used in TIG welding?	Lecturing Demonstration and conducting experiments	End Exam
13	**Experiment -12** GAS TUNGSTEN ARC WELDING – Preparation of T joint in Horizontal Position	CO - 4	1.What is other name for GTAW?	Lecturing Demonstration and conducting experiments	End Exam
14	**Experiment -13** GAS TUNGSTEN ARC WELDING – Preparation of Butt joint in Vertical Position	CO - 4	1.What is the full form of GTAW?	Lecturing Demonstration and conducting experiments	End Exam
15	**Experiment -14** Simulation of MMAW welding	CO - 5	1.What are the types of electrodes available for selection in the simulator?	Lecturing Demonstration and conducting experiments	End Exam
16	**Experiment -15** Simulation of GMAW welding	CO - 5	1.What is the plate thickness selected for MMAW in the simulator?	Lecturing Demonstration and conducting experiments	End Exam
17	**Experiment -16** Simulation of GTAW welding	CO - 5	1.What are the types of joints you can perform using Simulator?	Lecturing Demonstration and conducting experiments	End Exam
18	**EXTERNAL LAB EXAM**				

End semester assessment methods: External Lab Exam