SCHEME OF COURSE WORK

Course Details:

Course Title	**: Thermal Engineering Lab**		
Course Code	**: 13ME1124**	**L T P C**	**: 0 0 3 2**
Program:	**: B Tech**		
Branch:	**: Mechanical Engineering**		
Semester	**: FIFTH**		

Course Outcomes (COs):

On successful completion of the laboratory course, the student should be able to

co	Course Outcomes	Cognitive Level
1	Compare the valve timing diagram and port timing diagram of Internal Combustion Engines	Remember , Understand , Apply
2	Estimate the performance of different Internal Combustion Engines.	Remember , Understand , Apply
3	Estimate the performance of two stage reciprocating air compressor.	Remember , Understand , Apply
4	Calculate COP of Refrigeration and air-conditioning units.	Remember , Understand , Apply
5	Differentiate various types of boilers; demonstrate assembly and disassembly of I. C. Engine.	Remember , Understand , Apply

Program Outcomes (POs):

A undergraduate of Mechanical Engineering will have the

PO 1	Apply the knowledge of mathematics, science, engineering fundamentals to solve complex mechanical engineering problems
PO 2	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
PO10	Communicate fluently with the engineering community and society, and will be able to prepare reports and make presentations effectively
PO11	Apply knowledge of the engineering and management principles to managing projects and finance in multidisciplinary environments
PO12	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	S	M										
CO-2	S	M										
CO-3	S	M										
CO-4	S	M										
CO-5	S	M										

S - Strongly correlated, *M - Moderately* correlated, *Blank - No correlation*

Assessment Methods:	Observation / Record / Internal Exam / End Exam

Teaching-Learning and Evaluation

Week	CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	I. C. Engines valve / port timing diagrams.	CO 1	How the Valves and ports are opening at intervals with respect to TDC or BDC	Experiment	Internal Lab 1 Observation Record Submission (Week 1)
2	I .C Engines performance Test on four-stroke Single cylinder Diesel Engines.	CO 2	What is the performance of the engine when applied at various loads.	Experiment	Internal Lab 1 Observation Record Submission (Week 2)
3	I.C. Engines performance Test on two-stroke Petrol Engine.	CO 2	What is the performance of the engine when applied at various loads.	Experiment	Internal Lab 1 Observation Record Submission (Week 3)
4	Performance test on a variable compression ratio engine..	CO 2	What is the performance of the engine when applied at various Compression ratios keeping the load constant.	Experiment	Internal Lab 1 Observation Record Submission (Week 4)
5	Study of boilers.	CO 5	What are the different high pressure boilers and low pressure boilers.	Experiment	Internal Lab 1 Observation Record Submission (Week 5)
6	COP of a refrigeration Unit.	CO 4	What are the different components of a domestic refrigerator.	Experiment	Internal Lab 1 Observation Record Submission (Week 6)
7	**Internal Exam - I**				
8	Performance test on 2 stage reciprocating air – compressor unit	CO 3	What is the purpose of an intercooler.	Experiment	Internal Lab 2 Observation Record Submission (Week 8)
9	I.C. Engines heat balance sheet.	CO 2	What are the different losses we observe in performing a test on an engine.	Experiment	Internal Lab 2 Observation Record Submission (Week 9)
10	I .C Engines performance Test on four-stroke Twin cylinder Diesel Engines.	CO 2		Experiment	Internal Lab 2 Observation Record submission

					(Week 10)
11	I.C Engines A/F Ratio and volumetric efficiency.	CO 2	What is the performance of the engine when applied at various loads.	Experiment	Internal Lab 2 Observation Record Submission (Week 11)
12	Dis-assembly/assembly of engines.	CO 5	What are the different parts of an engine.	Experiment	Internal Lab 2 Observation Record Submission (Week 12)
13	Evaluation of engine friction by conducting morse test on 4-S multi cylinder petrol engine retardation and motoring test on 4-S diesel engine.	CO 2	What are the different methods to find indicated power..	Experiment	Internal Lab 2 Observation Record Submission (Week 13)
14	**Internal Exam – II**				
					END EXAM