THERMAL ENGINEERING LAB

Course Code: 13ME2308 **L P C**
0 3 2

Course Outcomes:

At the end of the course, the student will be able to

CO1 : Measure the compressibility of real gases and dryness fraction of steam.

CO2 : Evaluate the performance of variable compression engines, air conditioning systems, heat pipe and refrigeration system.

CO3 : Analyze exhaust gases and test the evacuated tube concentrator.

CO4 : Determine overall heat transfer co-efficient for double pipe heat exchanger with parallel and counter flow.

CO5 : Test the performance of pin fin under natural convection and forced convection.

LIST OF EXPERIMENTS:

Any TEN Experiments.

1. Compressibility factor measurement of different real gases.
2. Dryness fraction estimation of steam.
3. Performance test on a variable compression ratio (VCR) diesel engine.
4. Exhaust gas analysis with gas analyzer.
5. COP of refrigeration system.
6. Performance of an air-conditioning system.
7. Pin fin experiment under natural convection heat transfer conditions.
8. Pin fin experiment under forced convection heat transfer conditions.
9. Double pipe heat exchanger with parallel and counter flow.
10. Finned tube heat exchanger.
11. Performance of heat pipe.
12. Evacuated tube concentrator.

MEASUREMENTS IN THERMAL ENGINEERING

Course Code: 13ME2309

L	**P**	**C**
4	**0**	**3**

Course Outcomes:

At the end of the course, student will be able to

CO1 : Identify the suitable instrument for measuring transport parameters and estimate error

CO2 : Detect suitable range of pressure gauge and compute its dynamic response

CO3 : Distinguish different flow visualization methods and temperature measurements.

CO4 : Determine thermal conductivity in solids, liquids and gases and radiation measurements

CO5 : Develop transfer function of given mechanical system by using concept of control system.

UNIT-I

Instrument classification, static and dynamic characteristics of instruments, experimental error analysis, systematic and random errors, statistical analysis, uncertainty, reliability of instruments,

Variable resistance transducers, capacitive transducers, piezoelectric transducers, photoconductive transducers, photovoltaic cells, ionization transducers, Hall effect transducers.

UNIT-II

Dynamic response considerations, Bridgman gauge, McLeod gauge, Pirani thermal conductivity gauge, Knudsen gauge, Alphatron.

UNIT-III

Flow measurement by drag effects; hot-wire anemometers, magnetic flow meters, flow visualization methods, interferometer, Laser Doppler anemometer.

Temperature measurement by mechanical effect, temperature measurement by radiation, transient response of thermal systems, thermocouple compensation, temperature measurements in high- speed flow.