

MME313(L): IC Engines Lab

Programme: B. Tech. (MME)
Course: Core

Year: III
Credits: 1

Semester: VI
Hours: 2 (per week)

Course Context and Overview (100 words):

The objective of the Lab is to provide the students with practical knowledge of fundamentals of the fluid statics, dynamics and fluid machinery e.g. Hydraulics turbines, pumps etc. This will help the students to develop the skill in understanding the working principles, mechanisms and applications of the basic elements or components of the fluid or hydraulic machines. The further detailed objectives are as following:

1. To understand the basic concept and calculate fuel properties e.g. calorific value, density etc. for IC engine applications.
2. To understand and calculate the performance parameters through conducting load test on SI engines
3. To understand and calculate the performance parameters through conducting load test on CI engines with different modes.
4. To understand and calculate the performance parameters through conducting load test on Reciprocating compressor.

Prerequisite Courses: Engineering Thermodynamics and theory part of IC Engines

Course outcomes (COs):

On completion of this course, the students will have the ability to:
CO1 Understand and calculate important fuel properties of IC engines
CO2 Determine the performance parameters through conducting load test on SI engines
CO3 Determine the performance parameters through conducting load test on CI engines under different modes
CO4 Determine the performance parameters through conducting load test on Reciprocating compressor.

Course Topics: (List of Experiment for IC engines Lab)

S. No.	Name of the experiment	Hours
1.	To study the Cut section model and to determine the valve timings	2
2.	To Study the performance characteristics of single cylinder four stroke manual diesel engine	2
3.	To Study the performance characteristics of Multi cylinder four stroke petrol engine	4
4.	To Study the performance characteristics of single cylinder four stroke diesel engine with open ECU	4
5.	To Study the performance characteristics of Reciprocating Compressor	4
6.	To study the bomb calorimeter and determine the calorific value of a liquid and/or solid fuel	2
7.	To study and determine the density and viscosity of a liquid fuel	2
8.	To study and hands-on practice on AVL Boost Software	2

Textbook references (IEEE format):**Text Book:**

1. Ganesan V, *Internal combustion Engines*, Tata McGraw Hill Pub. Co. Ltd., 3rd Edition, 2007.
2. Heywood John B, *Internal combustion Engines Fundamentals*, McGraw Hill, Latest Edition.

Reference books:

1. Pulkrabek W. W, *Engineering Fundamentals of the Internal Combustion Engine*, PHI Learning Private Limited, Latest Edition.
2. Mathur M. L and Sharma R. P, *Internal Combustion Engines*, Dhanpat Rai & Sons, Latest Edition

Additional Resources (NPTEL, MIT Video Lectures, Web resources etc.): NPTEL, MIT

Evaluation Methods:

Item	Weightage (%)
Internal sessional assessment (Lab work with report)	60
End term practical Examination	40

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Last Update: _08-01-2018_____