Program :	**Diploma in Automobile Engineering**
Course Code : **4058**	Course Title: **Heat Power Engineering Lab**
Semester : **4**	Credits: **1.5**
Course Category: **Program Core**	
Periods per week: **3 (L:0, T:0, P:3)**	Periods per semester: **45**

Course Objectives:

- To enhance the skills of students to test the properties of fuels and lubricating oils.
- To conduct experiments on petrol, diesel engines and air compressors.
- To infer the results to understand the various conditions prevailing in the engines and compressors.

Course Prerequisites:

Topic	Course code	Course name	Semester
Basic knowledge about properties fuels and lubricating oil		Applied Chemistry	1
Basic knowledge of IC Engines		Internal Combustion Engines	3

Course Outcomes:

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

COn	Description	Duration (Hours)	Cognitive Level
CO1	Apply the procedures of testing properties of fuels and lubricating oils.	12	Applying
CO2	Experiment with Petrol engines to test the various performance characteristics.	13	Applying
CO3	Experiment with Diesel engines to test the various performance characteristics.	11	Applying
CO4	Make use of an air compressor to test its performance.	6	Applying
	Lab Exam	3	

CO – PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2			2		2	2
CO2	3			2		2	2
CO3	3			2		2	2
CO4	2			2			

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline:

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Apply the procedures of testing properties of fuels and lubricating oils.**		
M 1.01	Make use of viscometer, flash and fire point apparatus, and Calorimeter	3	Applying
M 1.02	Experiment with Viscometer to test the viscosity and viscosity index of a given lubricating oil	3	Applying
M 1.03	Experiment with Flash and Fire point apparatus to test the flash point and fire point of a given fuel	3	Applying
M1.04	Experiment with Calorimeter to test the calorific values of solid, liquid and gaseous fuels	3	Applying
CO2	**Experiment with Petrol engines to test the various performance characteristics**		
M2.01	Experiment with Single Cylinder Petrol engine to test the various performance characteristics – Load test. Make use of the data and plot various characteristic curves.	3	Applying
M2.02	Experiment with Multi cylinder Petrol engine to find various performance characteristics – Load test. Make use of the data and plot various characteristic curves.	3	Applying
M2.03	Experiment with multi cylinder Petrol engine to find indicated power – Morse test.	3	Applying
M2.04	Experiment with petrol engine to test the heat generated and heat utilized by the engine. Prepare heat balance sheet.	4	Applying
	Lab Test - I	1.5	

CO3		**Experiment with Diesel engines to test the various performance characteristics**		
M3.01		Experiment with Single cylinder Diesel engine to test the various performance characteristics – Load test. Make use of the data and plot various characteristic curves.	3	Applying
M3.02		Experiment with Multi cylinder Diesel engine to test the various performance characteristics – Load test. Make use of the data and plot various characteristic curves.	4	Applying
M3.03		Experiment with Diesel engine to test the heat generated and heat utilized by the engine. Prepare the heat balance sheet.	4	Applying
CO4		**Make use of an air compressor to test its performance**		
M4.01		Experiment with air compressor to test its performance.	3	Applying
M4.02		Make use of the data and plot various characteristic curves.	3	Applying
		Open Ended Experiments **		Applying
		Lab Test – II	1.5	

** - Suggested Open Ended Projects

(Not for End Semester Examination but compulsory to be included in Continuous Internal Evaluation. Students can-do open-ended experiments as a group of 2-3. There is no duplication in experiments between groups.

Example:

1. Experiment with Viscometer to find the viscosity and viscosity index of different fluids.

2. Choose alternate fuels like bio fuels and experiment with Petrol/Diesel engine to test various engine performance characteristics.

Text / Reference:

T/R	Book Title/Author
T1	Internal combustion Engines – M L Mathur & R P Sharma - Dhanpat Rai and sons
R2	Internal combustion engine - V Ganesan - TataMc-Graw Hill
R3	Internal combustion engines – R K Rajput – Lakhmi Publications.
R4	A course in Internal Combustion Engines – V M Domkundwar & A V Domkundwar - Dhanpat Rai and sons
R5	A Textbook of Thermal Engineering – R S Khurmi - S Chand Publishing

Online Resources:

Sl.No	Website Link
1	https://www.sciencedirect.com/book/9780080227184/internal-combustion-engines
2	https://www.icat.in/testlabs/4
3	https://www.araiindia.com/services/department-and-laboratories