Lok Jagruti Kendra University
University with a Difference

Diploma
in
Automobile Engineering

LJ Polytechnic

Course Code: 025010503
Automobile Fuels

Programme / Branch Name	Diploma in Automobile Engineering					
Course Name	Automobile Fuels				**Course Code**	025010503
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses BSC: Basic Science Courses
ESC: Engineering Science Courses PCC: Program Core Courses
OEC: Open Elective Courses PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

Teaching Hours / Week					**Evaluation Scheme**				
L	**T**	**P**	**Total Teaching Hours**	**Total Credit**	**CA**	**CCE**	**SEE (TH)**	**SEE (PR)**	**Total**
4	0	0	4	4	10	40	50	-	100

Legends: L: Lectures T: Tutorial P: Practical
CA: Continuous Assessment (Attendance + Activity)
CCE: Continuous & Comprehensive Evaluation
SEE (Th): Semester End Evaluation (Theory)
SEE (Pr): Semester End Evaluation (Practical)

2. Prerequisite

- ✓ Chemistry
- ✓ Fundamentals of Internal Combustion Engine

3. Rationale

The course aims to impart knowledge of different chemical compositions of different fuels that behave differently during the combustion process. It provides opportunity to learn different properties of fuels and lubricants, and their effect on the working of internal combustion engine. The impact of the properties of the fuels on the Environment has also been discussed in the course.

4. Objectives

- ✓ Understand various properties of fuels and lubricants.
- ✓ Identify the impact of various properties of fuels on environment.
- ✓ Learn the role of different fuel properties in combustion process.
- ✓ Understand the procurement and refining process of fuels and lubricant.

5. Contents

Unit No.	Unit Name	Topics	Learning Outcome	% Weightage	Hours
1.	**Petroleum Refining Processes for Fuels and Lubricants**	1.1 Introduction & Origin of Crude oil 1.2 Structure of Petroleum Products 1.3 Classification of Fuels Based on Hydrocarbons 1.4 Manufacture of fuels and Lubricant	• Understanding origin and manufacturing of Fuels and lubricants	20	08
2.	**Properties and Testing of Fuels**	2.1 Requirement of an Ideal Fuel 2.2 Various Desirable Properties of Fuel 2.3 Various Fuel Additives and its Impact on Performance of Combustion Process 2.4 Measuring and Testing Properties of Fuels	• Understanding purpose of additives in fuel	30	13
3.	**Combustion Process in SI and CI Engine**	3.1 Process of Combustion of Fuel in SI Engine 3.2 Process of Combustion of Fuel in CI Engine 3.3 Phenomena of Detonation and Knocking in Combustion Process 3.4 Factors Affecting Detonation and Knocking	• Understanding mechanism of combustion in SI and CI engine	20	08
4.	**Theory of Lubrication and Properties of Lubricant**	4.1 Fluid Friction and Theory of Lubrication 4.2 Important Functions of Lubricating Oil 4.3 Gradation of Lubricating Oil 4.4 Properties of Lubricating Oil 4.5 Measuring and Testing Properties of Lubricants 4.6 Function and Types of Additives in Lubricating Oil	• Understanding properties and additives of Lubricants	20	07
5.	**Alternative Fuels**	5.1 Introduction to Alternative Fuels 5.2 Necessity for Alternative Fuels 5.3 Classification of Alternative Fuels	• Learning impact of Alternative fuels on Engine performance and Environment	10	06

		5.4 Properties of Alternative Fuels 5.5 Effect on Combustion Process, Engine Performance and Environment of Alternative Fuels			
				Total Hours	**42**

6. Suggested Specification Table for Evaluation Scheme

Unit No.	Unit Name	Distribution of Topics According to Bloom's Taxonomy					
		R %	U %	App %	C %	E %	An %
1.	Petroleum Refining Processes for Fuels and Lubricants	40	40	10	0	10	0
2.	Properties and Testing of Fuels	35	45	10	0	10	0
3.	Combustion Process in SI and CI Engine	30	50	10	0	10	0
4.	Theory of Lubrication and Properties of Lubricant	30	50	10	0	10	0
5.	Alternative Fuels	40	40	10	0	10	0

Legends: R: Remembering U: Understanding App: Applying C: Creating E: Evaluating An: Analyzing

7. Reference Books

1) Fuels and Fuel-Additives by S. P. Srivastava, Wiley Publisher
2) Fundamentals of Internal Combustion Engines by H. N. Gupta, PHI learning
3) Fuels and Fuel Technology, Vol. I & II by Francis, W
4) Alternate Fuels by Dr. S. Thipse, Jaico Publications
5) Alternative Fuels by Sunggyu Lee, Taylor & Francis

8. Open Sources (Website, Video, Movie)

1) https://www.youtube.com/watch?v=MmWwjkpF1oU
2) https://www.youtube.com/watch?v=vD0kbdIS6kE
3) https://www.youtube.com/watch?v=vp6vVotshX0
4) https://www.youtube.com/watch?v=4O3nC9l_lF0
5) https://afdc.energy.gov/fuels/
6) https://en.wikipedia.org/wiki/Alternative_fuel
7) https://cleantechnica.com/2012/03/08/top-eight-alternative-fuels/