Lok Jagruti Kendra University

University with a Difference

Diploma in Automobile Engineering

LJ Polytechnic

Course Code:025010305

Automobile Design

Programme / Branch Name	Diploma in Automobile Engineering					
Course Name	Automobile Design				**Course Code**	025010305
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

- ✓ Physics
- ✓ Engineering Materials and Mechanics of Solid.

3. Rationale

The course aims to impart basic skills for understanding of design procedure of automobile engine components and Power transmission components.

4. Objectives

- ✓ Penetrate deep into various factors, which affects the design and needs to be addressed while designing.
- ✓ Grasp the importance safety during Design Procedure.
- ✓ Understand the performance parameters and testing methodologies.
- ✓ Understand the necessity of Standard design procedure.
- ✓ Understand the design procedure for various engine components and transmission system components.

5. Contents

Unit No.	Unit Name	Topics	Learning Outcome	% Weightage	Hours
1.	**Introduction to Design**	1.1 Design and its types, General consideration, factors affecting the design, Material selection process. 1.2 Standardization in automobile, various SI codes and SI units with their definition, various types of loads, force, stress, strain. 1.3 stress concentration, factor of safety, ergonomics.	• Grasp the basic introduction of design.	15	8
2.	**Design of Engine - 1**	2.1 General Consideration and Factors affecting the design of piston, 2.2 Function, Material and various stress and load on Piston 2.3 Design Procedure of Piston with Examples. 2.4 General Consideration and Factors affecting the design of connecting rod, 2.5 Function, Material and various stress and load on connecting rod 2.6 Design Procedure of connecting rod with Examples.	• Design and understand the piston and Connecting rod with help of formulas.	25	12
3.	**Design of Engine - 2**	3.1 General Consideration and Factors affecting the design of Flywheel and crankshaft, 3.2 Function, Material and various stress and load on Flywheel and Crankshaft. 3.3 Fluctuation of energy in Flywheel	• Design and Understand the Flywheel, and Crankshaft with help of formulas.	15	12
4.	**Design of Transmission – 1**	4.1 General Consideration and Factors affecting the design of clutch, 4.2 Function, Material and various stress and load on clutch	• Design and Understand the Clutch, and Propeller shaft with help of formulas	25	12

		4.3 Design Procedure of Clutch with Examples. 4.4 General Consideration and Factors affecting the design of Propeller shaft, 4.5 Function, Material and various stress and load on Propeller shaft 4.6 Design Procedure of Propeller shaft with Examples.			
5.	**Design of Transmission - 2**	5.1 Gear Terminology 5.2 Types of Gear 5.3 General Consideration and Factors affecting the design of Gear 5.4 Relation between number of teeth, speed and torque in meshing Gear. 5.5 Calculation of number of teeth and speed of gear with torque transmitted.	• Design and Understand the Gears with help of formulas	20	12
				Total Hours	**56**

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.	Introduction to Design	50	20	20	0	10	0
2.	Design of Engine - 1	35	20	35	0	10	0
3.	Design of Engine - 2	35	20	35	0	10	0
4.	Design of Transmission - 1	35	20	35	0	10	0
5.	Design of Transmission - 2	35	20	35	0	10	0

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

7. Reference Books

1) Machine Design by RS Khurmi, Satya Prakshan (Text Book)
2) Auto Design by R.B. Gupta, Satya Prakashan
3) Auto Engines by R.B. Gupta, Satya Prakashan
4) Automobile Engineering Vol. 2 by Dr. Kirpal Singh, Standard Publishers
5) Automotive Mechanics by William Crouse, McGraw Hill

8. Open Sources (Website, Video, Movie)

1) https://www.youtube.com/c/TheAutomotives
2) https://www.youtube.com/channel/UC4la8Cf7-DxaxsfMhaWpHiQ
3) https://theautomobileengineers.blogspot.com/
4) http://nptel.ac.in/
5) https://www.youtube.com/c/LearnEngineering
6) http://www.learnerstv.com/
7) http://auto.howstuffworks.com/