

Utkalmani Gopabandhu Institute of engineering, Rourkela
Department of mechanical Engineering

LESSON PLAN

Session :: Summer – 2023

Semester date::19/01/23 to 28/04/23

Course Type :: Theory

Semester/Branch :: 6th Semester, Mechanical Engineering

**Subject (with code) :: Automobile Engineering and Hybrid Vehicle
(Th-02)**

Contact hours/week :: 4

Name of Faculty :: Kalebar Singh

week	class	topic
1st	1	Automobiles: Definition, need and classification
	2	Layout of automobile chassis with major components (Line diagram)
	3	Clutch System: Need, Types (Single & Multiple)
	4	Working principle with sketch: Different types of clutches.
2nd	1	Gear Box: Purpose of gear box, Types
	2	Construction and working of a 4 speed gear box
	3	Concept of automatic gear changing mechanisms
	4	Propeller shaft: Constructional features and working
3rd	1	Differential: Need, Types and Working principle
	2	Working of differential of 4-wheeler
	3	Review class
	4	Test/& Assignment
4th	1	Braking systems in automobiles: Need and types
	2	Mechanical Brakes
	3	Hydraulic Brake
	4	Air Brake and Vacuum Brake

5th	1	Air assisted Hydraulic Brake
	2	Quiz Test
	3	Assignment Evaluation & Class Test
	4	Battery ignition system: Schematic diagram, elements and working
6th	1	Magnet ignition system: Schematic diagram, elements and working
	2	Spark plugs: Purpose, construction and specifications
	3	Common ignition troubles and its remedies
	4	Conventional suspension system for Rear and Front axle
7th	1	Independent suspension system used in cars (coil spring and tension bars)
	2	Constructional features and working of a telescopic shock absorber
	3	Practice Test/& Assignment
	4	Engine cooling: Need and classification
8th	1	Cooling systems of IC engine
	2	Defects of cooling and their remedial measures
	3	Engine lubrication: Need and classification
	4	Describe the Lubrication System of I.C. engine
9th	1	Class test
	2	Carburetion process for Petrol Engine
	3	Fuels for Automobiles, Fuel Properties
	4	Air fuel ratio, Carburettor
10th	1	Multipoint fuel injection system for Petrol Engine
	2	Air fuel ratio of diesel engine. Filter for Diesel engine
	3	Elements of fuel injection system of Diesel engine
	4	Working principle of fuel injection system for multi cylinder Engine
11th	1	Principle of Fuel feed pump and Fuel Injector for Diesel engine
	2	Introduction to Electric and Hybrid vehicles
	3	Social and Environmental importance of Hybrid and Electric Vehicles
	4	Description of Electric Vehicles, operational advantages
12th	1	Present performance and applications of Electric Vehicles
	2	Battery for Electric Vehicles, Battery types and fuel cells
	3	Hybrid vehicles, Types of Hybrid and Electric Vehicles

	4	Parallel, Series, Parallel and Series configurations
13th	1	definitions of jigs and fixture, advantages, disadvantages
	2	Drive train
	3	Solar power generation and its application for automobiles
	4	Quiz Test

Learning Resources

1. Automobile Engineering by R.B.Gupta (Satya Prakashan publication)
2. Automobile Engineering Vol- I & II by Dr Kirpal Singh (Standard Publishers)
3. Electric & Hybrid Vehicles – Design Fundamentals by Iqbal Hussain (CRC Press)