

**Utkalmani Gopabandhu Institute of engineering,  
Rourkela Department of mechanical Engineering**

**LESSONPLAN**

**Session::Summer-2024**

**Semester date::16/01/24 to 26/04/24**

**Course Type::Theory**

**Semester/Branch::6<sup>th</sup> Semester, Mechanical Engineering**

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

**Number of hours/week::4**

**Name of Faculty:: Kalebar Singh**

week	class	topic
1 <sup>st</sup>	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.
2 <sup>nd</sup>	1	Gear Box: Purpose of gearbox, Types
	2	Construction and working of a 4 speed gearbox
	3	Concept of automatic gear changing mechanisms
	4	Propeller shaft : Constructional features and working
3 <sup>rd</sup>	1	Differential :Need, Types and Working principle
	2	Working of differential of 4-wheeler
	3	Review class
	4	Test/&Assignment
4 <sup>th</sup>	1	Braking systems in automobiles: Need and types
	2	Mechanical Brakes
	3	Hydraulic Brake
	4	Air Brake and Vacuum Brake

5 <sup>th</sup>	1	Air assisted Hydraulic Brake
	2	Quiz Test
	3	Assignment Evaluation & Class Test
	4	Battery ignition system: Schematic diagram, elements and working
6 <sup>th</sup>	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
7 <sup>TH</sup>	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
8 <sup>th</sup>	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 o f I.C. engine
9 <sup>th</sup>	1	Class test
	2	Carburetion process for Petrol Engine
	3	Fuels for Automobiles, Fuel Properties
	4	Air-fuel ratio, Carburetor
10 <sup>th</sup>	1	Multi point 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
11 <sup>th</sup>	1	Quiz Test
	2	Principle of Fuel feed pump and its working
	3	Fuel Injector for Diesel engine
	4	Introduction to Electric and Hybrid vehicles
12 <sup>th</sup>	1	Social and Environmental importance of Hybrid and Electric Vehicles
	2	Description of Electric Vehicles, operational advantages
	3	Present performance and applications of Electric Vehicles



	4	Battery for Electric Vehicles, Battery types and fuel cells
13 <sup>th</sup>	1	Hybrid vehicles, Types of Hybrid Vehicles and
	2	Electric Vehicles and types
	3	Parallel, Series, Parallel and Series configurations
	4	Drive train
14 <sup>th</sup>	1	Solar power generation and its application for automobiles
	2	Solar powered vehicles
	3	Quiz Test
	4	Revision
15 <sup>th</sup>	1	Revision
	2	Doubt clearing class
	3	Previous year semester question discussion
	4	Previous year semester question discussion

### 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)