

GOVERNMENT POLYTECHNIC, MALKANGIRI
DEPARTMENT OF MECHANICAL ENGINEERING

| LESSON PLAN | | |
|---|--|--|
| Discipline: Mechanical Engineering | Semester 6th | Name of the Teaching Faculty: SATYABAN KOPE |
| AUTOMOBILE ENGINEERING AND HYBRID VEHICLES | No. of days/week class allotted 4 | Semester From date:22.12.2025 To date:18.04.2026 No. of Week: 15 |
| PRE-REQUISITE | AUTOMOBILE ENGINEERING AND HYBRID VEHICLES | |
| Course Outcomes | 1. Understand automobile chassis, transmission, breaking and fuel system etc. 2. Understand the basics of electric vehicle kinematics. 3. Understand the concepts of hybrid electric vehicles. | |
| Week | Class Day | Theory/Practical Topics |
| 1st | 1st | Automobiles: Definition, need and classification |
| | 2nd | Layout of automobile chassis with major components (Line diagram) |
| | 3rd | Clutch System: Need, |
| | 4th | Types (Single & Multiple) and Working principle with sketch |
| 2nd | 1st | Gear Box: Purpose of gear box |
| | 2nd | Construction and working of a 4 speed gear box |
| | 3rd | Concept of automatic gear changing mechanisms |
| | 4th | Propeller shaft: Constructional features |
| 3rd | 1st | Differential: Need |
| | 2nd | Types and Working principle |
| | 3rd | Braking systems in automobiles: Need and types |
| | 4th | Mechanical Brake |
| 4th | 1st | Hydraulic Brake |
| | 2nd | Air Brake |
| | 3rd | Air assisted Hydraulic Brake |
| | 4th | Vacuum Brake |
| 5th | 1st | Describe the Battery ignition and Magnet ignition system |
| | 2nd | Spark plugs: Purpose |
| | 3rd | construction and specifications |
| | 4th | State the common ignition troubles and its remedies |
| 6th | 1st | Description of the conventional suspension system for Rear and Front axle |
| | 2nd | Description of the conventional suspension system for Rear and Front axle |
| | 3rd | Description of independent suspension system used in cars (coil spring and tension bars) |
| | 4th | Description of independent suspension system used in cars (coil spring and tension bars) |
| 7th | 1st | Constructional features and working of a telescopic shock absorber |
| | 2nd | Constructional features and working of a telescopic shock absorber |
| | 3rd | Engine cooling: Need and classification |
| | 4th | Engine cooling: Need and classification |
| 8th | 1st | Describe defects of cooling and their remedial measures |
| | 2nd | Describe defects of cooling and their remedial measures |
| | 3rd | Describe the Function of lubrication |
| | 4th | Describe the lubrication System of I.C. engine |
| 9th | 1st | Describe the lubrication System of I.C. engine |
| | 2nd | Describe Air fuel ratio |
| | 3rd | Describe Air fuel ratio |
| | 4th | Describe Carburetion process for Petrol Engine |
| 10th | 1st | Describe Carburetion process for Petrol Engine |
| | 2nd | Describe Multipoint fuel injection system for Petrol Engine |
| | 3rd | Describe the working principle of fuel injection system for multi cylinder Engine 5.5 Filter for Diesel engine |
| | 4th | Describe the working principle of fuel injection system for multi cylinder Engine 5.5 Filter for Diesel engine |
| 11th | 1st | Describe the working principle of Fuel feed pump and Fuel Injector for Diesel engine |
| | 2nd | Describe the working principle of Fuel feed pump and Fuel Injector for Diesel engine |
| | 3rd | Describe the working principle of Fuel feed pump and Fuel Injector for Diesel engine |
| | 4th | Introduction, Social and Environmental importance of Hybrid and Electric Vehicles |
| 12th | 1st | Introduction, Social and Environmental importance of Hybrid and Electric Vehicles |
| | 2nd | Introduction, Social and Environmental importance of Hybrid and Electric Vehicles |
| | 3rd | Description of Electric Vehicles |
| | 4th | operational advantages, present performance and applications of Electric Vehicles |
| 13th | 1st | operational advantages, present performance and applications of Electric Vehicles |
| | 2nd | Battery for Electric Vehicles |
| | 3rd | Battery types and fuel cells |
| | 4th | Hybrid vehicles |

| | | |
|------|-----|--|
| 14th | 1st | Types of Hybrid and Electric Vehicles |
| | 2nd | Types of Hybrid and Electric Vehicles |
| | 3rd | Parallel, Series, Parallel and Series configurations |
| | 4th | Parallel, Series, Parallel and Series configurations |
| 15th | 1st | Drive train |
| | 2nd | Drive train |
| | 3rd | Solar powered vehicles |
| | 4th | Solar powered vehicles |

Learning Resources:

1. R.B. Gupta - Automobile Engineering
2. Dr. R.K. Singh - Automobile Engineering Vol- I & II
3. C.P. Nakra - Automobile Engineering
4. W.H. Course - Automotive Engine

Satyabam kope

Signature of
Faculty

B.S. Singh

Signature of HOD/

B.S. Singh

Signature of Academic
Coordinator

B.S. Singh
12/25

Signature of Principal