

COURSE TITLE : ADVANCED AUTOMOBILE ENGINEERING
COURSE CODE : 6054
COURSE CATEGORY : E
PERIODS/WEEK : 5
PERIODS/SEMESTER : 75
CREDITS : 5

TIME SCHEDULE

| Module | Topic | Periods |
|--------------|--|-----------|
| 1 | Advanced fuel injection system and its components in Petrol and Diesel engines | 19 |
| 2 | Pollutants from automobile engines | 18 |
| 3 | Modern vehicle accessories | 18 |
| 4 | Modern vehicle safety devices | 20 |
| TOTAL | | 75 |

GENERAL COURSE OUTCOME

| Sl. No. | Sub | Students Will be able to |
|---------|-----|--|
| | 1 | Understand the advanced fuel injection system in Petrol engine and Diesel engine |
| | 2 | Analyse the various pollutants from automobile engines |
| | 3 | Explain impact of smoke and its control |
| | 4 | Understand the refrigerants used in cars |
| | 5 | Understand the automotive emission control norms |
| | 6 | Comprehend the Modern vehicle accessories |
| | 7 | Comprehend the Modern vehicle safety devices |

SPECIFIC COURSE OUTCOME

MODULE I

1.1.0 Understand the advanced fuel injection system in Petrol engine and Diesel engine

- 1.1.1 Describe Port fuel injection and throttle body injection
- 1.1.2 Explain M.P.F.I
- 1.1.3 Differentiate the types-L-MPFI & D-MPFI
- 1.1.4 Explain fuel supply systems in MPFI
- 1.1.5 Explain Gasoline direct injection system
- 1.1.6 Describe the working of different types of sensors
- 1.1.7 Explain the working of different types of actuators
- 1.1.8 Explain CRDI system
- 1.1.9 Explain ECM
- 1.1.10 Describe the working of electronic fuel injectors

MODULE II

2.1.0 Analyze the various pollutants from automobile engines

- 2.1.1 List the effects of pollutants
- 2.1.2 Explain the sources of automobile pollution
- 2.1.3 Identify evaporative losses, crank case blow by, exhaust emissions
- 2.1.4 List and explain the different methods adopted to control petrol engine and diesel engines emissions
- 2.1.5 Describe blow by control system, PCV system, after burner, catalytic converter, control of oxides of nitrogen - EGR and Evaporative emission control system using Charcoal canister
- 2.1.6 Explain the impact of Diesel smoke and its control
- 2.1.7 Discuss the automotive emission control norms- EURO and BHARATH STAGE Standards.

MODULE III

3.1.0 Comprehend the Modern vehicle accessories

- 3.1.1 Explain cruise control
- 3.1.2 Describe the working of electric seat and mirror
- 3.1.3 Explain intelligent wind screen wiper
- 3.1.4 Explain automobile air conditioning
- 3.1.5 List the various components of a/c
- 3.1.6 Identify the refrigerants used in automobiles
- 3.1.7 List the various control devices of a/c
- 3.1.8 Illustrate the Automatic Climatic Control

MODULE IV

4.1.0 Comprehend the Modern vehicle safety devices

- 4.1.1 Explain restraint system-Seat belt
- 4.1.2 Describe the supplementary restraint system-Air bag
- 4.1.3 Explain electronic stability control
- 4.1.4 Explain ABS
- 4.1.5 Illustrate anti-theft system in vehicle-key less entry & Vehicle immobilizer
- 4.1.6 Explain automatic traction control system
- 4.1.7 Explain G P S
- 4.1.8 Describe adaptive noise control system
- 4.1.9 Explain working of Parking distance control
- 4.1.10 Familiarize with the In car Infotainment and Head up Display
- 4.1.11 Describe the concept of Drive by wire

CONTENT DETAILS

MODULE I

Methods of improving fuel economy, Fuel injection systems in petrol and diesel engines, Port fuel injection and throttle body injection, Types of injection- sequential, grouped and simultaneous injections. fuel supply systems in MPFI, Gasoline direct injection system, sensors, actuators, CRDI, Electronic control module (ECM) control functions, Inputs and outputs of electronic control module (ECM), electronic fuel injectors.

MODULE II

Emission norms- EURO and BHARATH stage, Effect of pollutants-sources of pollution- methods to control petrol engine and diesel engine emissions-. Reduction of compression ratio, blow by control system, PCV system, After burner, catalytic converter, control of oxides of nitrogen – EGR -Evaporative emission control system-Charcoal canister- Diesel smoke and its control.

MODULE III

Vehicle accessories-cruise control, electric seat and mirror, intelligent wind screen wiper, Automobile air conditioning system-Working, Components and their location, Refrigerants, a/c control devices, automatic climatic control (brief description only)

MODULE IV

Restraint systems-Seat belt, air bag, electronic stability control, ABS, EBD, key less entry & Vehicle immobilizer, automatic traction control system, adaptive noise control system, Parking distance control, In car infotainment, Head up Display,G P S, Concept of Drive-by wire. (brief description only)

TEXT BOOKS

1. Jack Erjavec - A systems approach to automotive technology – Cengage Learning
2. M L Mathur&R P Sharma - A course in internal combustion engines – Dhanpat Rai

REFERENCE

- 1 Anil chikkara - Automobile Engg. Vol. 1 to 4 – Satya Prakasan
- 2 Crouse & Anglin - Automotive emission control – McGraw-Hill
- 3 Barry Hollembeak - Automotive Electricity & Electronics – Cengage Learning
4. R B Gupta - Automobile engineering - Satya Prakasan -

Halderman series- www.prenhall.com

Delmar series- www.delmar.com