

COURSE TITLE : **ADVANCED AUTOMOBILE ENGINEERING**
COURSE CODE : **5030**
COURSE CATEGORY : **E**
PERIODS/WEEK : **4**
PERIODS/SEMESTER : **72**
CREDITS : **4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Advanced fuel injection system in petrol and diesel engine	17
	Test I	1
2	Automobile emission and its control	17
	Test II	1
3	Mechatronics & modern vehicle accessories	17
	Test III	1
4	Modern vehicle safety devices	17
	Test IV	1
	Total	72

OBJECTIVES

Upon completion of this study, the student should be able to know:

- 1.1.1 Advanced fuel injection system in Petrol engine and Diesel engine
- 1.1.2 List methods of improving fuel economy
- 1.2.0 Explain Fuel injection systems in petrol and diesel engines
 - 1.2.1 Explain Port fuel injection and throttle body injection
 - 1.2.2 Explain M.P.F.I
 - 1.2.3 Explain the types-L-MPFI & D-MPFI
 - 1.2.4 Explain fuel supply systems in MPFI
 - 1.2.5 Explain Gasoline direct injection system
 - 1.2.6 Explain the working of different type of sensors
 - 1.2.7 Explain the working of different type of actuators
 - 1.2.8 Explain CRDI system
 - 1.2.9 Explain ECM
 - 1.2.10 Describe the working of electronic fuel injectors
- 2.1.0 Describe the various pollutants from automobile engines
 - 2.1.1 Mention the effect of pollutants
 - 2.2.0 Explain the sources of automobile pollution
 - 2.2.1 Evaporative losses, crank case blow by, exhaust emissions
 - 2.3.0 List and explain different methods adopted to control petrol engine and diesel engines emissions
 - 2.3.1 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
- 2.4 Diesel smoke and its control
- 2.5 Discuss automotive emission control norms- EURO and BHARATH STAGE standards.
- 3.1.0. Understand basic concepts in mechatronics & Working of modern vehicle accessories
 - 3.1.1 Basic concepts of mechatronics
 - 3.1.2 Introduction to mechatronics
 - 3.1.3 Define mechatronics
 - 3.1.4 Explain advantages of mechatronics
- 3.2.0 Comprehend Modern vehicle accessories
 - 3.2.1 Explain cruise control
 - 3.2.2 Familiarise the working of electric seat and mirror
 - 3.2.3 Explain intelligent wind screen wiper
 - 3.2.4 Explain automatic climatic control
 - 3.2.5 Explain adaptive noise control system
 - 3.2.6 Explain working of Parking distance control
- 4.1.0. Comprehend Modern vehicle safety devices
 - 4.1.1 Explain restraint system-Seat belt
 - 4.1.2 Explain supplementary restraint system-Air bag
 - 4.2.1 Explain electronic stability control
 - 4.3.1 Explain ABS
 - 4.4.1 Explain anti theft system in vehicle-key less entry & Vehicle immobilizer
 - 4.5.1 Explain automatic traction control system
 - 4.6.1 Explain G P S

CONTENT OUTLINE

MODULE-I

Advanced fuel injection system in Petrol engine and Diesel engine

Methods of improving fuel economy- Fuel injection systems in petrol and diesel engines,-Port fuel injection and throttle body injection- M.P.F.I-types- fuel supply systems in MPFI- Gasoline direct injection system- sensors- actuators, CRDI, ECM- electronic fuel injectors

MODULE-II

Automobile pollution and control

Effect of pollutants-sources of pollution- methods to control petrol engine and diesel engines 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- emission norms- EURO and BHARATH stage

MODULE-III

Mechatronics & Modern vehicle accessories

Concepts of mechatronics-advantages, Vehicle accessories-cruise control- electric seat and mirror- intelligent wind screen wiper- automatic climatic control- adaptive noise control system- Parking distance control

MODULE-IV

Modern vehicle safety devices

Restraint systems-Seat belt -Air bag, electronic stability control- ABS-key less entry & Vehicle immobilizer- automatic traction control system- G P S

TEXT BOOKS

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

REFERENCE

- 2 Automobile Engg. Vol. 1 to 4 - Anil chikkara
- 3 Diesel engine reference Manual - L R C Lilly, Butter worths publications
- 4 Automotive fuel systems Vol I&II - T.K Garrets, SAE
- 5 Internal combustion engines - V Ganesan
- 6 Internal combustion engines theory and practice - S P Sen
- 7 Automotive emission control - Crouse & Anglin
- 8 Automobile Electricity & Electronics - Barry Hollembeak
9. Introduction to Internal combustion engines - Richard stone
10. Automobile engineering----R B Guptha
Halderman series- www.prenhall.com
Delmar series- www.delmar.com