

## VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MECHANICAL ENGINEERING

### INTRODUCTION TO AUTOMOBILE ENGINEERING

(Open Elective-III)

SYLLABUS FOR B.E. V-SEMESTER

Instruction : 3Hours	SEE Marks : 60	Course Code : U21OE520ME
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

Course objectives	Course Outcomes
The objectives of this course are to: <ol style="list-style-type: none"> <li>1. familiarize the student with the different types of automobiles and engine components along with its working.</li> <li>2. impart adequate knowledge in fuel supply, cooling, lubrication and ignition of IC engines.</li> <li>3. understand the steering geometry, steering mechanism and types of suspension systems.</li> <li>4. gain the knowledge about working of clutch, gear box mechanism, and brakes</li> <li>5. make the student conversant with types of wheels, tyres and pollution control techniques.</li> </ol>	On completion of the course, the student will be able to: <ol style="list-style-type: none"> <li>1. identify types of Automobiles and engine components and describe its working.</li> <li>2. describe the engine fuel Supply system in petrol and Diesel engines, cooling system, and lubrication systems.</li> <li>3. describe the steering mechanism, suspension systems</li> <li>4. describe the working principle and operation of clutch, gear mechanism and brakes.</li> <li>5. know the pollutants from automobile and pollution control techniques and identify the types of wheels, tyres.</li> </ol>

CO-PO and CO-PSO mapping															
CO	PO mapping												PSO mapping		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	1	1		1	2	2					3	3	2	3
CO2	3	2	2		2	2	2					3	3	2	3
CO3	3	2	2		1	2	2					3	3	2	3
CO4	3	1	2		2	2	2					3	3	2	3
CO5	3	1	2		2	2	3					3	3	2	3

#### UNIT-I

**Introduction:** Types of automobiles: Hybrid Vehicles, Electrical, gas and Fuel cell vehicles. Chassis and body, Lay out of transmission system, Engine components: cylinder block, cylinder head, crankcase, crank shaft and cam shaft. Types and working of IC Engines: SI and CI engines, two stroke and four stroke engines.

#### UNIT-II

**Fuel system:** Fuel supply system for SI engines and CI engines. Simple carburettor, Introduction to Multipoint fuel injection system (**MPFI**) of petrol engines, Introduction to **CRDI** system for diesel engines.

**Cooling system:** air cooling, water cooling: Thermo syphon, pump circulation system.

**Lubrication system:** Petrol System, splash system, pressure lubrication: Wet sump and Dry Sump.

**Ignition system:** Battery Ignition System, Magneto Ignition System and Electronic Ignition System.

#### UNIT-III

**Suspension system:** Rigid axle, Independent suspension system: Double wish bone type, Macpherson strut system, Air suspension system.

**Steering system:** wheel alignment, Ackermann steering mechanism, steering geometry: camber, caster, toe-in, toe-out, steering linkage for vehicle with rigid axle front suspension, steering linkage for vehicle with independent front suspension.

#### UNIT –IV

**Power Train:** Single plate clutch, Multi plate clutch. Manual Gear Box: sliding mesh gear box, constant mesh gear box, synchromesh gear box and Automatic Gear Box. Working principle of Differential.

**Brakes:** Types: Drum and Disc brakes, Mechanical and Hydraulic Brakes, **ABS** system.

#### UNIT –V

**Wheels and Tyres:** Types of Wheels: wire wheels, disc wheels, alloy wheels. Types of tyres: Tube type, tubeless type.

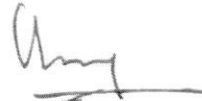
**Automobile Emissions and control:** Automobile pollutants and sources of pollution. Pollution Control Techniques: Catalytic Converters, EGR and PCV. Bharath emission Norms.

**Learning Resources:**

1. Crouse & Anglin, "Automobile Engineering", 10<sup>th</sup> Edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2007.
2. Kirpal Singh, "Automobile Engineering", Vol.I& II, 13<sup>th</sup> Edition, Standard Publishers, New Delhi 2013.
3. R.B Gupta, "Automobile Engineering" 7<sup>th</sup> Edition, Satya Prakashan, New Delhi, 2015.
4. Joseph Heitner, "Automotive Mechanics", 2<sup>nd</sup> Edition, Affiliated East West Pvt. Ltd., 2013.
5. C.P. Nakra, "Basic Automobile Engineering", 7<sup>th</sup> Edition, Dhanpat Rai Publishing C (P) Ltd., 2016.

**The break-up of CIE: Internal Tests+Assignments + Quizzes**

1	No. of Internal Tests:	02	Max.Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05
Duration of Internal Test: 90 Minutes				



**Chairman**  
**Board of Studies**  
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