

AUTOMOBILE ENGINEERING

VIII Semester: ME								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AME020	Core	L	T	P	C	CIA	SEE	Total
		3	-	-	3	30	70	100
Contact Classes:45		Tutorial Classes: Nil			Practical Classes: Nil		Total Classes: 45	
<p>COURSE OBJECTIVES:</p> <p>The course should enable the students to:</p> <ol style="list-style-type: none"> I. Understand the function of various parts of automobile, features of fuel supply systems for S.I and C.I engines. II. Distinguish the features of various types of cooling, ignition and electrical systems. III. Identify the merits and demerits of the various transmission and suspension systems. IV. Recognize the working of various braking and steering systems. V. Summarize the ways and means of reducing the emissions from automobiles. <p>COURSE OUTCOMES (COs):</p> <p>CO 1: Understanding design and analysis of power transmitting elements, selection of suitable materials and manufacturing processes.</p> <p>CO 2: Analyzing the forces acting on various joints and their design.</p> <p>CO 3: To develop an ability to identify, formulate, and solve various machine members problems</p> <p>CO 4: Ability to design and analyze shafts with different geometrical features under various loading conditions.</p> <p>CO 5: Ability to analyze and design of different Springs for required application.</p> <p>COURSE LEARNING OUTCOMES (CLOs):</p> <ol style="list-style-type: none"> 1. Understand the basic working of Auto mobile and different automobile components 2. Understand the importance of lubrication system in automobile. 3. Compare different fuel injection system and advantages of each individual and concept electronic controlled fuel injection. 4. Compare the different cooling processes in I.C engines, working of radiator and cooling accessories. 5. Analyse the different spark ignition system advantages of each individual system. 6. Understand the working of different automobile components like lighting system, horn, wiper, fuel gauge, temperature indicator. 7. Understand the different working principles of clutches, and fly wheel. 8. Analyse the transmission systems like gear boxes, propeller shafts, universal joints, differential gear boxes. 9. Explain the shock absorbers, suspension system and mechanisms. 10. Compare the types of braking system, working principles. 11. Explain the steering system and components of steering system. 12. Explain the steering mechanisms, techniques to improve better steering. 13. Understand the importance of pollution controls, pollution control techniques. 14. Understand the importance of alternative fuels to reduce the environment emotions. 15. Analyse the different alternative energy sources to reduce the environment emotions. 								

UNIT-I	INTRODUCTION	Classes: 09
<p>Introduction to automobile engineering, chassis and body components, types of automobile engines, engine lubrication, engine servicing; Fuel system; spark ignition engine fuel supply systems, mechanical and electrical fuel pump, filters, carburetor types, air filters, petrol injection, multipoint fuel injection(MPFI) and gasoline direct injection systems; Compression ignition engines fuel supply systems, requirement of diesel injection systems, types of injection systems, direct injection systems, indirect injection (IDI) systems, fuel pump, nozzle, spray formation, injection timing, testing of fuel pumps, CRDI and turbocharged direct injection (TDI) systems.</p>		
UNIT -II	COOLING SYSTEM	Classes: 09
<p>cooling requirements, air cooling, water cooling, thermo, water and forced circulation system, radiators types cooling fan, water pump, thermostat, pressure sealed cooling, antifreeze solutions, intelligent cooling; Ignition system: Function of an ignition system, battery ignition system constructional features of storage, battery, contact breaker points, condenser and spark plug, magneto coil ignition system, electronic ignition system using contact breaker, electronic ignition using contact triggers, spark advance and retard mechanism; Electrical system: Charging circuit, generator, current-voltage regulator, starting system, bendix drive mechanism solenoid switch, lighting systems, automatic high beam control, horn, wiper, fuel gauge, oil pressure gauge, engine temperature indicator.</p>		
UNIT -III	TRANSMISSION AND SUSPENSIONS SYSTEMS	Classes: 09
<p>Transmission system: Clutches, principle, types, cone clutch, single plate clutch, multi plate clutch, magnetic and centrifugal clutches, fluid flywheel, gear box, types, sliding mesh, constant mesh, synchro mesh gear boxes, epicyclic gear box, auto transmission, continuous variable transmission over drive, torque converter, propeller shaft, Hotch-Kiss drive, torque tube drive, universal joint, differential, rear axles, types, wheels and tyres.</p> <p>Suspension system: Objects of suspension systems, rigid axle suspension system, torsion bar, shock absorber, independent suspension system, air suspension system, Daimler-benz vehicle suspension.</p>		
UNIT -IV	BRAKING AND STEERING SYSTEMS	Classes: 09
<p>Braking system: Mechanical brake system, Hydraulic brakes system, Master cylinder, wheel cylinder tandem master cylinder; Requirement of brake fluid, Pneumatic and vacuum brake, anti-skidbraking (ABS), regenerative braking; Steering system: Steering geometry, camber, castor, king pin, rake, combined angle, toe-in, toe-out, center point steering, types of steering mechanism, power steering, Hydraulic, electronics, Ackerman steering mechanism, Davis steering mechanism, steering gears types, steering linkages, special steering colomuns.</p>		
UNIT -V	EMISSIONS FROM AUTOMOBILES	Classes: 09
<p>Emissions from Automobiles, Pollution standards national and international, various pollution control techniques: Multipoint fuel injection for spark ignition engines, common rail diesel injection, variable valve timing, closed crank cake ventilation, pc valves, EGR valve, catalytic converters, catalyst window, lambda probe, energy alternatives, solar, photo-voltaic, hydrogen, biomass, alcohols, LPG, CNG, liquid Fuels and gaseous fuels, hydrogen as a fuel for internal combustion engines, their merits and demerits, standard vehicle maintenance practice.</p>		
Text Books:		
<ol style="list-style-type: none"> 1. WillamH Crouse,DonaldL. Anglin, –AutomobileEngineering ,McGraw-Hill,10th Edition,2006. 2. Manzoor, NawazishMehdi, YosufAli, –A Text Book Automobile Engineering , Frontline Publications, 1st Edition,2008. 3. Dr.KirpalSingh,–AutomobileEngineering ,StandardPublishers ,2nd Edition,2013. 		

Reference Books:

1. R.K. Rajput, –A Text Book of Automobile Engineering, Laxmi Publications, 1st Edition, 2010.
2. S. Srinivasan, –Automotive Engines, McGraw-Hill, 2nd Edition, 2003.
3. Khalil U Siddiqui, –A Text Book of Automobile Engineering, New Age International, 1st Edition, 2009.

Web References:

1. <http://nptel.kmeacollege.ac.in/syllabus/125106002/>

E-Text Books:

1. <http://www.engineeringstudymaterial.net/tag/automotive-engineering-books/>
2. www.engineering108.com/.../Automobile_Engineering/Automobile-engineering-ebook

Course Home Page: