LESSON PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
20ME6E02	AUTOMOBILE ENGINEERING	VI	Mechanical Engineering	5	2024-25	18-11-24

COURSE OUTCOMES

1	CO1: Classify and describe the different parts of an automobile engine. [K2]
2	CO2: Describe the working principle of transmission system and describe parts of transmission system. [K2]
3	CO3: Distinguish different steering components and steering. [K2]
4	CO4: Explain working principle of various parts of automobile such suspension and braking systems. [K2]
	CO5: Explain the various components of electrical systems, lubrication systems and safety systems used in automobiles. [K2]

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	CO1: Identify the components of automobile, types of drives and engine specifications. [K2]	1. INTRODUCTION				
		1.1	Introduction to automobile engineering, Classification of automobiles	T1,R2	1	Chalk & Talk, PPT and Videos
		1.2	Major components of four wheeler automobile – chassis and body , power plant, power transmission,	T1,T2,R1	2	
		1.3	Types of drives - Rear wheel drive, Front wheel drive, Four wheel drive	T1,R1	2	
		1.4	Car body styles	T1,T2,R1	1	
		1.5	Super charger - working principle, types of super chargers.	T1,R1	1	
		1.6	Turbo charger– working principle, Crank case ventilation.	T1,R1,	1	
		1.7	Engine Specifications with regard to power, speed, torque, number of cylinders and arrangement, lubrication and cooling systems	T1,R1, R2	1	
		1.8		T1	1	
				Total	9	
II	CO2: Describe the working of different elements of automobile transmission system.	2.TRANSMISSION SYSTEM				
		2.1	Clutches – working principle, types, Single plate clutch	T1, R1,R2	1	Chalk & Talk, PPT and Videos
		2.2	Multi plate clutch, Magnetic Centrifugal	T1, R1,R2	1	
		2.3	Semi centrifugal clutche	T1,R2	1	
		2.4	Fluid fly wheel	T1, R2	1	
		2.5	Gear box -Sliding mesh gear box	T1, R1	1	

		2.6	Constant mesh gear box	T1, R1	1	
		2.7	Synchromesh gear box	T1, T2	1	
		2.8	Epicyclic gear box	T1, R1	1	
		2.9	Torque converter, Propeller shaft	T1, R1	1	
		2.10	Universal joint, differential,	T1, R1	1	
		2.11	Rear axle drives – Hotchkiss drive, Torque tube drive	T1, R1	1	
		2.12	Rear axle shaft supporting – semi Floating, full floating, and three quarter floating axles.	T1, R1	1	
		2.13	**(content beyond syllabus)** Over drive	T1	1	
				Total	13	
III	**CO3:** Describe the steering geometry, steering mechanisms and steering gears of an automobile. [K2]	**3.STEERING SYSTEM**				
		3.1	Function and requirements of steering system and general arrangement of steering system	T1,T2, R2	1	Chalk & Talk, PPT and Active learning method
		3.2	Steering geometry – camber, castor, king pin rake , Combined angle toe-in, toe-out, Center point steering.	T1,T2, R2	2	
		3.3	Steering mechanism – Ackerman steering mechanism	T1,T2, R2	1	
		3.4	Davis steering mechanism,	T1,T2, R2	1	
		3.5	Steering gears.	T1,T2, R2	2	
		3.6	Steering linkages	T1,T2, R2	1	
		3.7	Power steering(**Beyond syllabus**)	T1	1	
				Total	09	
IV	**CO4:** Describe and compare different suspension and braking systems of an automobile. [K2]	**4. BRAKING SYSTEM**				
		4.1	Function and Requirements of Braking system, Types of Brakes, Drum Brakes and Mechanical brakes	T1, R1	1	Chalk & Talk, PPT and Videos
		4.2	Disc Brakes		1	
		4.3	Hydraulic brakes –working Principle, Master cylinder	T1, R1	1	
		4.4	wheel cylinder, Tandem master cylinder	T1, R1	1	
		4.5	bleeding of hydraulic brakes, Pneumatic brakes	T1, R1	1	
		4.6	Vacuum brakes	T1, R1	1	
		USPENSION SYSTEM				
		4.7	Object of suspension systems, Types of suspension springs, Steel springs – Leaf springs, Tapered leaf spring	T1, R1	1	
		4.8	Coil spring and Torsion bar	T1, R1	1	
		4.9	Telescopic shock absorber	T1, R1	1	
		4.10	Rigid axle suspension system, independent axle suspension system –	T1, R1	1	
		4.11	Wishbone type, Mac Pherson strut type	T1, R1	1	
		4.12	Vertical guide type and swinging half axle type.	T1 ,R1	1	
		4.13	Hill holder (**Beyond syllabus**)	T1	1	
				Total	13	

V	**CO5:** Explain the various components of electrical systems, lubrication systems and safety systems used in automobiles. [K2]	**5.** ELECTRICAL SYSTEM, **ENGINE LUBRICATION & SAFETY SYSTEMS**				
		5.1	Requirements of charging circuit, generator circuit	T1,R1	1	Chalk & Talk, PPT and Active learning method
		5.2	Need for cut-out, cutout relay, combined current voltage regulator	T1, R1	1	
		5.3	Starting System, requirements, standard, Folo through type Bendix drive mechanism	T1, R1	1	
		5.4	compression spring type drives, over running clutch type and dyer type drives	T1, R1	1	
		5.5	Solenoid switch, Horn , Wiper,	T1, R1	1	
		5.6	Fuel gauge indicator, Lighting system	T1, R1	1	
		5.7	Engine lubrication- splash pressure lubrication system	T1, R1	1	
		5.8	Oil filters: Cartridge, edge type and centrifugal type	T1, R1	1	
		5.9	Oil pumps – Gear Pump, Rotor Pump, Vane Pump and Plunger Pump.	T1,R1	1	
		5.10	Safety systems - Introduction, seat belt, air bags	T1, R1	1	
		5.11	bumper, anti lock brake system (ABS)	T1, R1	1	
		5.12	Wind shield, suspension sensors, , mirrors	T1, R1	1	
		5.13	Traction control, central locking			
		5.14	Electric windows, speed control.	T1, R1	1	
				Total	14	
				CUMULATIVE PROPOSED PERIODS	**60**	

Text Books:

S.No	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
T1	Dr. Kirpal Singh, Automobile Engineering Volume I&II, 13th Edition, Standard Publications, New Delhi, 2014.
T2	R.K.Rajput. R. K, A Textbook of Automobile Engineering.,2nd edition, Lakshmi publications (P) Ltd., New Delhi, 2017.

Reference Books:

R1	R.B. Gupta , Automobile Engineering, 2nd edition , Satya Prakashan Publications, 2016.
R2	S. Narang " Automobile Engineering "2nd edition Khanna Publishers, 2012
R3	P.S Gill " Automobile Engineering ", 3rd edition S.K. Kataria & Sons, 2011.

Web Details

1	https://www.youtube.com/watch?v=c3CalfdYZYw&list=PLpe3qgeJLpB2wAoaRSY9_yAeOt7u0LTNd&index=1
	https://www.youtube.com/watch?v=qfkTVYJIx8Q&list=PLpe3qgeJLpB2wAoaRSY9_yAeOt7u0LTNd&index=2
2	https://youtube.com/watch?v=PYje-4D76kc
3	https://www.youtube.com/watch?v=S_B6Twq1FOE&list=PLpe3qgeJLpB2wAoaRSY9_yAeOt7u0LTNd&index=5
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		Name	Signature with date
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iii.	Module Coordinator	Dr. .R. LALITHA NARAYANA	18/11/24
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