

SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.D.T., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF MECHANICAL ENGINEERING

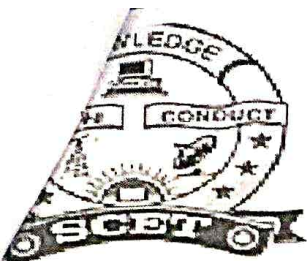
LESSON PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
16ME7E02	AUTOMOBILE ENGINEERING	VII	Mechanical Engineering	5	2021-22	04-10-21

COURSE OUTCOMES

1	CO1: Identify the components of automobile, types of drives and engine specifications. [K2]
2	CO2: Describe the working of different elements of automobile transmission system. [K2]
3	CO3: Describe the steering geometry, steering mechanisms and steering gears of an automobile. [K2]
4	CO4: Describe the different braking and suspension and systems of an automobile. [K2]
5	CO5: Describe the starting system and electrical accessories of electrical system of an automobile. [K2]
6	CO6: Describe the engine lubrication system and use of safety systems of an automobile. [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					Chalk & Talk, PPT and videos
		1.1	Introduction to automobile engineering, Classification of automobiles	T1,R2	1		
		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 chargers	T1,R1	1		
		1.6	Turbo chargers	T1,R1,	1		
		1.7	Crank case ventilation	T1,R1, R2	1		
		1.8	Engine Specifications with regard to power, speed, torque, number of cylinders and arrangement, lubrication and cooling systems	T1	1		
		1.9	(Beyond syllabus) Defects in frames		1		
Total						11	



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16ME7E02	AUTOMOBILE ENGINEERING	VII	Mechanical Engineering	5	2021-22	04-08-21

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		1.1	Introduction to automobile engineering, Classification of automobiles	T1,R2	1		
		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 chargers	T1,R1	1		
		1.6	Turbo chargers	T1,R1,	1		
		1.7	Crank case ventilation	T1,R1, R2	1		
		1.8	Engine Specifications with regard to power, speed, torque, number of cylinders and arrangement, lubrication and cooling systems	T1	1		
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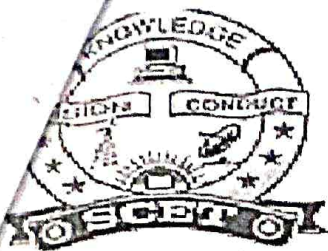
II	CO2: Describe the working of different elements of automobile transmission system. [K2]	2. TRANSMISSION SYSTEM				Chalk & Talk, PPT and videos
		2.1	Clutches – Single and Multi plate clutches	T1, R1,R2	1	
		2.2	Magnetic Centrifugal	T1, R2,R2	1	
		2.3	Semi centrifugal clutches	T1, R2	1	
		2.4	Fluid fly wheel	T1, R2	1	
		2.5	Gear boxes – Sliding mesh and Constant mesh gear box	T1, R1	1	
		2.6	Synchromesh gear box	T1, T2,R2	1	
		2.7	Epicyclic gear box	T1, R1	1	
		2.8	Torque converter, Propeller shaft	T1, R1	1	
		2.9	Universal joint, differential, rear axle	T1, R1	1	
		2.10	Rear axle drives – Hotchkiss drive, Torque tube drive	T1, R1	1	
		2.11	Rear axle shaft supporting – semi Floating, full floating, and three quarter floating axles.	T1, R1	1	
		2.12	(Beyond syllabus) Over drive	T1, R1	1	
Total				12		
III	CO3: Describe the steering geometry, steering mechanisms and steering gears of an automobile. [K2]	3. STEERING SYSTEM				Chalk & Talk, PPT and videos
		3.1	Function and requirements of steering system and general arrangement of steering system	T1,T2,R2	1	
		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, R1	1	
Total				09		
IV	CO4: Describe and compare different suspension and braking systems of an automobile. [K2]	4. BRAKING SYSTEM				Chalk & Talk, PPT and videos
		4.1	Function and Requirements of Braking system, Types of Brakes, Drum Brakes and Mechanical brakes	T1, R1	1	
		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	



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		SUSPENSION SYSTEM				
		4.9	Object of suspension systems, Types of suspension springs, Steel springs – Leaf springs, Tapered leaf spring	T1, R1	1	
		4.10	Coil spring and Torsion bar	T1, R1	1	
		4.11	Telescopic shock absorber	T1, R1	1	
		4.12	Rigid axle suspension system, independent axle suspension system –	T1, R1	1	
		4.13	Wishbone type, Mac Pherson strut type	T1, R1	1	
		4.14	vertical guide type and swinging half axle type.	T1, R1	1	
		4.15	Hill holder (Beyond syllabus)	T1, R1	1	
Total					13	
		5. ELECTRICAL SYSTEM				
V	CO5: Describe the starting system and electrical accessories of electrical system of an automobile. [K2]	5.1	Requirements of charging circuit, generator circuit	T1, R1	1	Chalk & Talk, PPT and videos
		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	T1, R1	1	
		5.6	Wiper, Fuel gauge indicator	T1, R1	1	
		5.7	Lighting system.	T1, R1	1	
		5.8	Vehicle Electrical System: Alternator (Beyond syllabus)	T1, R1	1	
Total					08	
		6. ENGINE LUBRICATION & SAFETY SYSTEMS				
VI	CO6: Describe the engine lubrication system and use of safety systems of an automobile. [K2, K3]	6.1	Engine lubrication- splash pressure lubrication system	T1, R1	1	Chalk & Talk, PPT and videos
		6.2	Oil filters: Cartridge, edge type and centrifugal type	T1, R1	1	
		6.3	Oil pumps – Gear Pump, Rotor Pump, Vane Pump and Plunger Pump.	T1, R1	1	
		6.4	Safety systems - Introduction, seat belt, air bags	T1, R1	1	
		6.5	bumper, anti lock brake system (ABS)	T1, R1	1	
		6.6	Wind shield, suspension sensors, traction control, mirrors	T1, R1	1	
		6.7	central locking and electric windows, speed control.	T1, R1	1	



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		6.11	Cars: Adaptive Cruise Control, (Beyond syllabus)	T1, R1	1
Total					8
CUMULATIVE PROPOSED PERIODS					61
Text Books:					
S.No	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION				
T1	Dr.Kirpal Singh, Automobile Engineering Volume I&II, 13 th Edition, Standard Publications, New Delhi, 2014.				
T2	R.K.Rajput. R. K, A Textbook of Automobile Engineering., 2 nd edition, Lakshmi publications (P) Ltd., New Delhi, 2017.				
Reference Books:					
R1	R.B. Gupta , Automobile Engineering, 2 nd edition , Satya Prakashan Publications, 2016.				
R2	S. Narang “ Automobile Engineering ” 2 nd edition Khanna Publishers, 2012				
R3	P.S Gill “ Automobile Engineering ”, 3 rd edition S.K. Kataria & Sons, 2011.				
Web Details					
1	http://nptel.ac.in/courses/107/106/107106088/				
2	http://nptel.ac.in/courses/107/106/107106080/				
3	http://nptel.ac.in/courses/107/106/107106087/				
4	http://nptel.ac.in/courses/107/106/107106082/				

		Name	Signature with date
i.	Faculty	Dr.R LALITHA NARAYANA	3/2/21
ii.	Faculty II (for common Course)	Mr. B. SRINIVAS	03/03/21
iii.	Course Coordinator	Dr. .R. LALITHA NARAYANA	3/2/21
iv.	Module Coordinator	Dr. .R. LALITHA NARAYANA	3/2/21
v.	Programme Coordinator	Dr. A. GOPICHAND	3/2/21

Principal