



C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF: - Technology & Engineering
DEPARTMENT OF: - Mechanical Engineering
SEMESTER: - VI
CODE: -4TE06AEN1
NAME – Automobile Engineering

Teaching & Evaluation Scheme:-

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE06AEN1	Automobile Engineering	3	0	2	5	4	30	1.5	70	3	---	20	30	150

Objectives:-

- To impart knowledge about transmission Systems, Clutches and its principles of friction clutch, types of suspension, Mechanical and hydraulic brakes and other automobile engineering functions.

Prerequisites: - Basic Knowledge about Physics.

Course outline:-

Sr. No.	Course Contents	Hours
1	Introduction to Automobile: Classification, Types of Automobiles, Layout, Main Component and vehicle assemblies, Resistance to the motion of vehicle, power required for propulsion of the vehicle and acceleration	04
2	Chassis and Frame: Requirements of Automobile Body; Vehicle Frame, Separate Body & Frame, Unitised Body, Car Body Styles, Front Engine Rear Drive & Front Engine Front Drive Vehicles, Four Wheel Drive Vehicles	03
3	Transmission system: Clutch –Functions of Clutch, Requirements of a good clutch, constructional features and working of different types of clutch, clutch plate, plate facing, clutch linkage, friction materials, factor affecting the power transmission by a clutch. Torque convertor.	05
4	Gear Box: Functions of gearbox, need of gear box, gears & gear ratios, principle of gearing, types of gear boxes, Gear shifting mechanism transfer case. Automatic Transmission: Basic devices used in automatic transmission, principle of epicyclic gearing, torque converter, free wheel clutch, over speed drive and its working, semi/fully automatic transmission, continuously variable transmission(CVT).	06



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5	Front axle and steering systems : Axle parts and materials, Load and Stress, steering, heads axle bearing wheel alignment, steering geometry layout of system, Steering system for independent suspension and front wheel drive, wheel wobble, power steering, etc.	05
6	Driveline and Differential : Propeller shaft, Drive Shaft, Universal joints. Constant velocity universal joints. Rear wheel drive arrangement: rear axle, Rear axle drives (Hotch kiss drive, torque tube drive), rear axle daft support, Different types of final drives. Differential principles. Constructional details of a differential gear unit. Non-slip and Limited slip differential. Differential locks Differential housings.	07
7	Suspension System: Principle, type of suspension system, conventional and independent front and rear axle, spring, rubber and air suspensions, automatic/hydro suspension system, shock absorbers, Trailer Suspension.	03
8	Brakes: Principle, braking distance, braking efficiency ,weight transfer, wheel skidding, principle and working of various types of brakes (like drum/disc/mechanical/girling mechanical/hydraulic etc.), power assisted brakes, hand brake, anti-lock brake systems (ABS), diagnosis of faults, adjustment and maintenance of brakes.	04
9	Electrical System, Modern Trends Electrical systems, battery types and construction, lighting, horn, indicators, sprays, wipers, Staring system, Instruments Sensors and actuators, Electronic Control Unit, Electronic stability program, traction control devices, Electrical car layout, Hybrid drives	04
10	Wheels & Tyres: Types of wheels, wheel dimensions, types of tyres (conventional tubed tyre/ tubeless tyre), comparison of radial and bias ply tyres, tyre materials, considerations in tread design, tyre section, tyre designations, Wheel Balancing, tyre wear indicators, nitrogen in tyres, factors affecting tyre life, wheel and tyre troubleshooting	04

Learning Outcomes:-

1. Students will gain thorough understanding of the construction and operating principles of Part of automobiles.
2. The subject helps the students to understand the latest developments in the field.

Text Books:

1. Automobile Engineering Vol- I & II by **Dr. Kirpal Singh**, Standard Pub.& Dist.
2. Automobile Engineering Vol- I & II by **Dr. K.M.Gupta**, Umesh Pub.
3. Automobile Engineering by **R. B. Gupta**, Satya Prakashan
4. Automobile Technology by **Dr. N. K. Giri**, Khanna Pub.
5. Automobile engineering by **Dr. V. M. Domkundwar**

Reference Books:

1. Automotive Mechanics by **W.Crouse** , Tata Mc Graw Hill
2. Automobile Engineering by **G. B. S. Narang**, Khanna Pub