Gautam Buddha University, Greater Noida

School of Engineering (Mechanical Engineering)

Degree	Course Name	Course Code	Marks:100
Integrated B. Tech. + M. Tech. / M.B.A.	Automobile Engineering	ME 308	SM+MT+ET 25+25+50
Semester	**Credits**	**L-T-P**	**Exam.**
VI	3	3-0-0	3 Hours

Unit - I

Introduction to Automobiles: Classification; Components; Requirements of automobile body; Vehicle frame; Separate body & frame; Unitised body; Car body styles; Bus body & commercial vehicle body types; Front engine rear drive & front engine front drive vehicles; Four wheel drive vehicles; Safety considerations; Safety features of latest vehicle; Future trends in automobiles;
Clutches; Requirement of clutches – principle of friction clutch – wet type & dry types; Cone clutch; Single plate clutch; Diaphragm spring clutch; Multi plate clutch; Centrifugal clutches; Electromagnetic clutch; Over running clutch; Clutch linkages. **(08 Hours)**

Unit - II

Power Transmission: Requirements of transmission system; General Arrangement of power transmission system; Object of the gear box; Different types of gear boxes; Sliding mesh; Constant mesh; Synchromesh gear boxes; Epi-cyclic gear box; Freewheel unit; Overdrive unit; Principle of overdrive; Advantage of overdrive; Transaxle; Transfer cases. **(07 Hours)**

Unit - III

Drive Lines, Universal Joint, Differential and Drive Axles: Effect of driving thrust and torque reactions; Hotchkiss drive; Torque tube drive and radius rods; Propeller shaft; Universal joints; Slip joint; Constant velocity universal joints; Front wheel drive; Principle; Function; Construction & operation of differential; Rear axles; Types of load on rear axles; Full floating; Three quarter floating and semi floating rear axles. **(07 Hours)**

Unit – IV

Suspension Systems: Need of suspension system; Types of suspension; Factors influencing ride comfort; Suspension spring; Constructional details and characteristics of leaf springs.

Steering System: Front wheel geometry & wheel alignment viz. Caster; Camber; King pin inclination; Toe-in/Toe-out; Conditions for true rolling motions of wheels during steering; Different types of steering gear boxes; Steering linkages and layout; Power steering; Rack & pinion power steering gear; Electronics steering. **(08 Hours)**

Unit V

Automotive Brakes; Tyres & Wheels: Classification of brakes; Principle and constructional details of drum brakes; Disc brakes; Brake actuating systems; Mechanical; Hydraulic; Pneumatic brakes; Factors affecting brake performance; Power & power assisted brakes; Tyres of wheels; Types of tyre & their constructional details; Wheel balancing; Tyre rotation; Types of tyre wear & their causes. **(07 Hours)**

Unit - VI

Emission Control System & Automotive Electrical: Sources of atmospheric pollution from the automobile; Emission control systems – Construction and operation of positive crank case ventilation (PVC) systems; Evaporative emission control; Heated air intake system; Exhaust gas recirculation (ECR) systems; Air injection system and catalytic converters; Purpose construction & operation of lead acid battery; Capacity rating & maintenance of batteries; Purpose and operation of charging systems; Purpose and operations of the starting system; Vehicle lighting system. **(08 Hours)**

Recommended Books:

1. Automobile Engineering; Anil Chhikara; Satya Prakashan; New Delhi.
2. Automobile Engineering; Kirpal Singh; Standard Publishers Distributors.
3. Automotive Mechanics Crouse; Anglin; Tata McGraw Hill; New Delhi.
4. Automotive Technology; H.M. Sethi; Tata McGraw Hill; New Delhi.
5. Automotive Mechanics; S. Srinivasan; Tata McGraw Hill; New Delhi.
6. Automotive Mechanics; Joseph Heitner; East West Press.
7. Motor Automotive Technology; E. Anthony Schwaller; Delmer Publishers; Inc.
8. The Motor Vehicle; Newton Steeds Garrett; Butter Worths.