

Branch Name:	Automobile Engineering
Program Code:	ET408
Course Title:	Automobile Transmission & Mechanism
Course Code:	2ET4080302
Pre-requisite Course:	-----

Course Objectives:

1. Install and test automobile power transmission, brakes, steering and suspension system during manufacturing.
2. Maintain automobile power transmission, brakes, steering and suspension system during service.
3. The practical should be carried out in such a manner that students are able to acquire different learning objectives in cognitive, psychomotor and affective domain to demonstrate course learning objectives.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	0	2	4	60	40	20	30	150

Course Contents:

Unit No	Topic	Total Hours	Weightage (%)
1	Introduction to Automobile Transmission System • Necessity of power transmission system of automobile vehicle • Advantages and disadvantages of various power transmission system. • Introduction of Chassis and Frame. • Differentiate chassis and frame.	08	15
2	Power transmission system (Clutch and Gearbox) • Necessity and requirement of clutch and gearbox. • Construction and functions of different types of clutches. • Working of clutch actuating mechanism. • Principal, construction and working of fluid coupling. • Construction and functions of sliding mesh, constant mesh, synchromesh gearbox. • Working of gear shifting mechanism. • Torque converter and overdrive construction & working. • List the various types and grade, rating of lubricating oil used for gear box.	10	25
3	Driveline and axles (Front and Rear axles) • Propeller shaft necessity (requirements), construction, function and its types. • Universal Joint necessity, construction, function and its types. • Final drive necessity, construction, function and its types. • Differential necessity, construction and working. • Types of front axle. • Rear axle function and its types. • Different types of axles mounting.	08	20

4	Steering and Braking systems • Necessity of steering geometry. • Describe Steering terminology: kingpin inclination, camber, caster, toe-in and toe-out. • Types of steering linkages and steering gears. • Effect of under & over steering, steering lock and turning circle radius. • Construction and working of power steering systems. • Necessity and working principle of braking system. • Types of brakes- its Construction and working, Braking Mechanism. • Friction material and its characteristic. • Properties of brake fluid.	08	20
5	Comfort and stability systems of vehicles • Necessity of suspension system in vehicle. • Types of springs use in suspension system. • Construction and functions of various types of suspension system. • Construction and functions of shock absorber. • Various types of wheel rims and its features. • Concept of tyre aspect ratio • Construction and application of wired spoke, disc and alloy wheels • Constructional details of tube and tubeless tyres. • Tyre rating and specification. • Types of tyre tread pattern. • Tyre rotation procedure. • Tyre recycling, benefits and ways to dispose.	08	20

List of Practical:

1. Classify various types of chassis & frames and draw different types of layouts for power flow from engine to wheels.
2. Identify various parts/ components of an automobile clutch and illustrate its working mechanism for given clutch.
3. Identify various parts/ components of an automobile gearbox and illustrate its working mechanism for given gear box.
4. Identify various parts / components of propeller shaft and universal joints and illustrate its working mechanism.
5. Identify various parts/ components of steering system and steering geometry and illustrate its working mechanism for given steering system.
6. Identify various parts/ components of hydraulic brake system and illustrate its working mechanism.
7. Identify various parts/ components of suspension system and illustrate its working mechanism for given suspension system.
8. Understanding tyre specifications and tyre size and identify suitable specification on wheels and tyres of a given vehicle.

Reference Books:

1. Automobile Engineering R. B. Gupta SatyaPrakashan, New Delhi
2. Automobile Engineering K. M. Gupta Umesh Publication
3. Automobile Engineering vol-II Anil Chhikara SatyaPrakashan, New Delhi
4. Transmission and power Train W.H.Crouse & D.L. Anglin Tata Mc-Graw Hill Publishing Co. Ltd
5. Automobile Engineering: (Vol-II) Singh Kirpal Standard Publishers Distributors

List of Open-Source Software/learning website:

1. <https://www.howacarworks.com>
2. <https://swayam.gov.in>
3. <https://auto.howstuffworks.com>
4. <https://nptel.ac.in>
5. <https://tinyurl.com/mr29c4x8> for video link
6. <https://tinyurl.com/4azv8h47> for web link

Course Learning Outcomes (CLO):

1. Identify various layout of Chassis-Frame and related power train system
2. Explain the construction and working of power train system.
3. Describe need and working of driveline components and various axle assemblies.
4. Explain the construction and operation of direction and stability control system.
5. Explain construction and operation of comfort and stability systems.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	L	M			M				L	M		M	M	L	M	
CLO2		M			L				L			M	L	L		
CLO3	M	L			M				M			L	M		M	
CLO4					M					L			M		M	
CLO5	L				L					M			L	M	M	

H: High, M: Medium, L: Low