SEMESTER S5

AUTOMOTIVE TRANSMISSION

Course Code	PCAUT503	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	4	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	None	Course Type	Theory

Course Objectives:

1. To impart basic knowledge in automotive transmission.
2. To understand the construction and principle of operation of various types of mechanical transmission components, hydrodynamic devices, hydrostatic devices and automatic transmission system

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SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	**Clutch And Gear Box** Requirement of transmission system, Principle of operation of clutches, classification, Construction of Single plate coil spring and Diaphragm spring clutches, Multi plate clutch, Cone clutch, Semi centrifugal clutch , Centrifugal clutch. Need and Objectives of Gear box. Construction and operation of Sliding mesh, Constant mesh and Synchromesh gearboxes, CVT and DCT – Simple problems on determination of gear ratios for vehicles.	9
2	**Epicyclic Gearboxes and Application** Principle of Planetary gear trains – Ford – T-model gearbox, Wilson Gear box, Electromagnetic transmission, Chevrolet “Turboglide” Transmission, Hydraulic control system for Automatic Transmission.	9
3	**Hydrodynamic Transmission** Fluid coupling-Principle-Constructional details. Performance characteristics. Reduction of drag torque in fluid coupling. Torque converter-Principle-	9

	constructional details, performance characteristics. Multistage torque converters and Polyphase torque converters.	
4	**Hydrostatic And Electric Drives** Hydrostatic drive; Various types of hydrostatic systems – Principles of Hydrostatic drive system. Advantages and limitations. Comparison of hydrostatic drive with hydrodynamic drive, construction and working of typical Janny hydrostatic drive. Electric drive-types- Principle of early and modified Ward Leonard Control system-Advantages & limitations.	**9**

Course Assessment Method
(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	**15**	**10**	**10**	**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

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Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Understand the Construction and working of different types of clutches, and gear boxes.	**K2**
CO2	Understand the Construction and working of different types of epicyclic gearboxes	**K2**
CO3	Compare the constructional details and principle of operation of hydrodynamic drives and hydraulic control.	**K1**
CO4	Compare various types of Hydrostatic drives, explain the principle of operation, advantages and limitations of electric drive	**K2**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table (Mapping od Course Outcomes to Program Outcomes)

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	2							
CO2	3	2	2	-	2							
CO3	3	3	2	-	2							
CO4	3	3	2	-	2							

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation*

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	The Motor Vehicle	Newton K and Steeds. W.	Butter Worth's & Co., Publishers Ltd	2001
2	The Automotive Transmission Book	Fischer and Pollack	Springer	2014
3	Automobile Mechanics	N. K. Giri	Khanna publishers	2008

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Automotive Transmission and Power Trains construction	Crouse W.H., Anglin D.L.	McGraw Hill	1992
2	Torque converters	Heldt, P.M.	Chilton Book Co.	1992
3	Modern Transmission systems	Judge, A.W.,	Chapman and Hall Ltd.	1990

Video Links (NPTEL, SWAYAM…)	
	Link ID
	Design of Mechanical Transmission Systems, IIT Madras,Prof. Ramkumar P https://onlinecourses.nptel.ac.in/noc24_me71/preview
	Fundamentals of Automotive Systems, IIT Madras, Prof. C. S. Shankar Ram

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