

1153AU102 AUTOMOTIVE TRANSMISSION

L T P C

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1. Preamble

This course provides an introduction to the Transmission like gearbox, clutch, fluid couplings, torque converters and electrical drives.

2. Pre-requisite

NIL

3. Links to other courses

- Vehicle Body Engineering
- Automotive chassis

4. Course Educational Objectives

Students undergoing this course are expected to

- To develop the basic knowledge of the students in mechanics, torque conversion areas.
- To develop the skills of the students in the areas of alternative drives and concepts.
- To serve as a pre-requisite course for other courses in UG and PG programs specialized studies and research.

5. Course Outcomes

Upon the successful completion of the course, learners will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
C01	Understand the concept of gear motions, drive line positions.	K2
C02	Study about different types of gearboxes.	K3
C03	Know about the multi stage and polyphase torque converters, performance characteristics	K3
C04	Study about Automatic transmission	K3
C05	Learn about the different drive systems	K3

(K2-understand, K3-Apply, K4-Analysis)

6. Correlation of COs with Programme Outcomes :

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H			H	H					L	L	
CO2	H			H	H					L	L	
CO3	H			H	H					L	L	
CO4	H			H	H					L	L	
CO5	H			H	H					L	L	

H- High; M-Medium; L-Low

7. Course Content

UNIT I Clutch and Gear Box

L-9

Different Types of Clutches - Principle - Construction and Torque Capacity. Determination of Gear Ratios for Vehicles. Different Types of Gearboxes Such as Sliding Mesh Gearbox - Constant Mesh Gearbox and Synchromesh Gearbox Fluid Coupling: Advantages and Limitations - Construction Details - Torque Capacity - Slip in Fluid Coupling - Performance Characteristics. Means Used to Reduce Drag Torque in Fluid Coupling

UNIT II Hydrodynamic Drive

L-9

All Spur and internal Gear Type Planetary Gearboxes - Ford T-Model - Cotal and Wilson Gear Box - Determination of Gear Ratios - Automatic Overdrives

UNIT III Torque Convertors

L-9

Principal of Torque Conversion - Single - Multi Stage and Polyphase Torque Converters - Performance Characteristics - Constructional and Operational Details of Typical Hydraulic Transmission Drives (E.G.) Leyland - White Hydro Torque Drives

UNIT IV Automatic Transmission

L-9

Automatic Transmission: Relative Merits and Demerits When Compared to Conventional Transmission - Automatic Control of Gears -AMT - Study of Typical Automatic Transmissions - Epicyclic Gear Train and Automatic Control of Gear Box - Clutch less Transmission -CVT -Transmission Control System

UNIT V Hydrostatic and Electric Drive

L-9

Hydrostatic Drives: Advantages and Disadvantages - Principles of Hydrostatic Drive Systems - Construction and Working of Typical Hydrostatic Drives - Janney Hydrostatic Drive. Electrical Drives: Advantages and Limitations - Principles of Ward Leonard System of Control Modern Electric Drive for Buses and Performance Characteristics.

Total: 45 Periods

8. Text Books

1. Heldt. P. M., Torque converters, Chilton Book Co., 1992

9. References

1. Newton and Steeds, The Motor vehicle, Illiffe Publishers, 1985.
2. Judge. A.W., Modern Transmission systems, Chapman and Hall Ltd., 1990.SAE Transactions 900550 & 930910.
3. Crouse. W.H., Anglin. D.L, Automotive Transmission and Power Trains construction, McGraw Hill,1976.