

1151AU108

AUTOMOTIVE TRANSMISSION

L T P C  
3 0 0 3**1. Preamble**

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

**2. Pre-requisite**

1151AU105	Mechanics of Machines
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**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	Describe the basic principle of clutch and gear box.	K2
C02	Explain the construction and working of different hydrodynamic drive	K2
C03	Understand the basic concepts of Fluid coupling and torque converter and its performance characteristics.	K2
C04	Explain various types of advanced automatic transmission system.	K2
C05	Demonstrate the hydrostatic and electric drive system.	K2

**6. Correlation of COs with Programme Outcomes :**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H			H	H					L	L		M	H
CO2	H			H	H					L	L		M	H
CO3	H			H	H					L	L		M	H
CO4	H			H	H					L	L		M	H
CO5	H			H	H					L	L		M	H

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 Vehicle. Different Types of Gearboxes such as Sliding Mesh Gearbox, Constant Mesh Gearbox and Synchromesh Gearbox

### **UNIT – II: HYDRODYNAMIC DRIVE**

**L-9**

All Spur and Internal Gear Type, Ford T-Model, Cotal and Wilson Gear Box, Electronically Controlled Automatic Transmission – Case Study - Determination of Gear Ratios, Automatic Overdrives.

### **UNIT – III: TORQUE CONVERTERS**

**L-9**

Fluid Coupling: Advantages and Limitations, Construction Details, Torque Capacity, Slip in Fluid Coupling, Performance Characteristics. Means used to Reduce Drag Torque in Fluid Coupling - Principal of Torque Conversion, Single, Multi Stage and Polyphase Torque Converters, Performance Characteristics, Constructional and Operational Details of Typical Hydraulic Transmission Drives.

### **UNIT – IV: AUTOMATIC TRANSMISSION**

**L-9**

Automatic Transmission: Relative Merits and Demerits when Compared to Conventional Transmission, Automatic Control of Gears, Study of Typical Automatic Transmissions, A/MT and Epicyclic Gear Train, Clutchless Transmission: CVT, Transmission Control System, Dual Clutch Transmission.

### **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, Borgwarner Electric Drive.

**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.