

**SUBJECT TITLE** : **AUTOMOBILE TRANSMISSION**  
**SUBJECT CODE** : **4020**  
**COURSE CATEGORY** : **A**  
**PERIODS/WEEK** : **4**  
**PERIODS/SEMESTER** : **72**  
**CREDITS** : **4**

**TIME SCHEDULE**

<b>MODULE</b>	<b>TOPICS</b>	<b>PERIODS</b>
1	Introduction – Clutch Principle of Friction Clutches Different types of Clutches Clutch Disc, pressure plate Operating Mechanism	16
2	Introduction – Gearbox Types of Gearboxes Gear Selector & shifting mechanism Power transmission in 2 & 3 wheelers Progressive type Gearbox	19
3	Propeller Shaft, Universal Joints, Front Wheel Drive, Differential Mechanism & Rear Axle	19
4	Wheels, Tyres, Brakes Modern Trends in Automobile Engineering	18
	<b>TOTAL</b>	<b>72</b>

**OBJECTIVES**

- 1.1.0 Recognize the various transmission members of the automotive vehicle
  - 1.1.1 Identify types of Transmission
  - 1.1.2 Review need for transmission
  - 1.1.3 State various components in transmission
  - 1.1.4 List the functions of clutch
  - 1.1.5 Explain the principle of operation of clutch
  - 1.1.6 Draw the line diagram and explain single plate clutch – multiplate clutch – diaphragm clutch
  - 1.1.7 Recognize the working principle of vacuum and hydraulically operated clutch
  - 1.1.8 Describe the details of fluid coupling
  - 1.1.9 Describe the constructional features of clutch disc, pressure plate and clutch operating mechanism
  
- 2.1.0 Understand the working construction of various types of gear boxes used in vehicle

- 2.1.1 State the objectives of gear box in transmission
  - 2.1.2 Explain the working of sliding mesh gearbox, constant mesh gearbox, synchro mesh gearbox, epicyclic gearbox
  - 2.1.3 Describe the principle and working of torque converter, overdrive mechanism and automatic transmission
  - 2.1.4 Explain the type of power transmission in 2, 3 & wheelers
  - 2.1.5 Describe the construction and working of progressive type gearbox.
  - 2.1.6 Identify CVT & ECVT-Automatic transmission (no figure)
- 3.1.0 Understand the types and working of universal joints and propeller shaft
    - 3.1.1 List the functions of propeller shaft and universal joints
    - 3.1.2 Explain the working of torque tube drive, Hotchkiss drive
    - 3.1.3 Identify the types of constant velocity joints and variable velocity joints
    - 3.1.4 Describe the working of differential mechanism
    - 3.1.5 Distinguish the working of locking differential and limited slip differential
    - 3.1.6 Identify the types and methods of operation in Rear Axles
- 4.1.0 Understand the specifications, tread patterns
    - 4.1.1 Specify wheels like, spoked wheel, disc wheel, alloy cast wheel & composite wheel
    - 4.1.2 Designate a wheel
    - 4.1.3 Explain constructional details of a tyre and Specify the types
    - 4.1.4 Designate a tyre
    - 4.1.5 Identify the tread patterns
    - 4.1.6 Differentiate the merits and demerits of under inflation and over inflation in tyres
    - 4.1.7 List the factors affecting tyre performance

### **CONTENT DETAILS**

#### MODULE- I

Introduction - Various components in transmission required for a good transmission system.

Principle

of friction clutches. Constructional features and working of-Single plate dry clutch-Diaphragm clutch-

Cone clutch-Centrifugal clutch-Semi centrifugal clutch-Vacuum clutch-Hydraulic clutch-Electro magnetic clutch-Over running clutches-Multiplate clutch (dry & wet)-Fluid fly wheel-Clutch disc –

constructional details and functions of each part, Pressure plate – constructional details and functions

of each part. Clutch operating mechanism

#### MODULE – II

Introduction – Necessity and functions of gearbox -Gearbox constructional features & working of -

Sliding mesh gearbox-Constant mesh gearbox-Synchro mesh gearbox- Progressive type gearbox  
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Epicyclic gearbox- Torque converter -Gear selector and shifting mechanism, 2 Wheeler transmissions-Gear drive-Chain drive-V matic transmission ,CVT& ECVT-Automatic transmission in cars.

#### MODULE – III

Introduction of Propeller shaft and universal joint-Torque tube drive-Hotchkiss drive-Variable velocity joints-Constant velocity joints-Front wheel drive-Differential mechanism-Locking differential -Limited slip differential-Rear Axles-types

#### MODULE – IV

Introduction of wheels & tyres-Wheels – wire – spoked wheel, disc wheel, and alloy cast wheel, composite wheel-Wheel specification-Tyres-Tyre specification-Tyre construction(cross sectional details).Tubeless tyre-Tyre treads patterns-Inflation pressure and its effects (both over & under inflation)-Factors affecting tyre performance.

#### TEXT BOOK

Automobile Engineering Vol. I -- Kripal Singh

#### REFERENCES

1. Automobile Chassis & Body : P.L. Kohli
2. An Introduction to Automobile Engineering : N.R. KhatawateAutomotive Mechanics
3. Automobile Engineering Vol. II : Joseph Heitner