

Hours Per Week :

L	T	P	C
2	1	-	3

Total Hours :

L	T	P	WA/RA	SSH/HSH	CS	SA	S	BS
30	-	30	25	40	2	3	2	-



### Course Description and Objectives:

This course offers fundamental and advanced concepts of two and three wheelers technology and helps the learner to develop basic understanding on power units, chassis, brakes and sub-systems. The objective of this course is to impart knowledge on basic and advanced concepts related to engines, gearboxes and clutches of two and three wheelers.

### Course Outcomes:

The student will be able to:

- understand the working of two and four stroke engines
- understand the functions of clutch and gear box
- familiarize with the technological developments in two and three wheelers
- understand the operations of three wheelers and latest models of three wheelers

### SKILLS:

*Identify different parts of gear box of two wheeler*

*Differentiate between two and three wheeler engine, transmission and chassis parts*

*Use different tools and gauges for different measurements*

*Identify and troubleshoot problems in two and three wheelers*

*Use different equipment and carryout performance tests*

**ACTIVITIES:**

- *Dismantle, inspect and assemble two and three wheeler engine/ clutch/gear box.*
- *Conduct performance test on shock absorber*
- *Perform brake efficiency test and brake adjustment*

**UNIT - 1****L-7**

**POWER UNIT :** Two stroke SI engine, Four stroke SI engine; Merits and demerits, Symmetrical and unsymmetrical port timing diagrams, Types of scavenging processes; Merits and demerits, Scavenging pumps, Rotary valve engine, Fuelsystem, Lubrication system, Magneto coil and battery coil spark ignition system, Electronic ignition system, Starting system, Kick starter system.

**UNIT - 2****L-7**

**CHASSIS AND SUB-SYSTEMS:** Mainframe and its types, Chassis and shaft drive, Single and multiple plates and centrifugal clutches, Gear box and gear controls, Front and rear suspension systems, Shock absorbers, Panel meters and controls on handle bar.

**UNIT - 3****L-5**

**BRAKES, WHEELS AND TYRES:** Drum brakes, Disc brakes, Front and rear brake links, Layouts, Spoked wheel, Cast wheel, Disc wheel, Disc types, Tyres and tubes.

**UNIT - 4****L-6**

**TWO WHEELERS:** Case study of major Indian models of motorcycles, Scooters and mopeds, TVS mopeds and motorcycles, Hero Honda motorcycles, Bajaj scooters and motorcycles, Yamaha, Enfield motorcycles, Servicing and maintenance.

**UNIT - 5****L-5**

**THREE WHEELERS:** Case study of Indian models, Auto rickshaws, Pickup van, Delivery van and trailer, Maintenance and fault tracing.

**LABORATORY EXPERIMENTS****LIST OF EXPERIMENTS**

Total hours: 30

1. Performance test of a two wheeler using chassis dynamometer.
2. Performance test on shock absorber
3. Two wheeler chain test
4. Brake and clutch adjustment
5. Dismantling and assembling of two wheeler gear box
6. Dismantling and assembling of three wheeler box
7. Three wheeler brake and clutch play adjustment
8. Dismantling and assembling of three wheeler steering system.
9. Study three wheeler chassis frame and power transmission system.

**TEXT BOOKS:**

1. P.E.Irving, " Motor Cycle Engineering", 5<sup>th</sup> edition, Temple Press, 1992.
2. N.K.Giri, "Automobile Mechanics", 8<sup>th</sup> edition, Khanna Publishers, 2006.

**REFERENCE BOOKS:**

1. M.Burton, "Encyclopedia of Motorcycling-20 volumes", Marshall Cavendish Corporation, 1989.
2. R.V.Vespa, "Maintenance and Repair Series", 3<sup>rd</sup> edition, S.Chand & Co., 1986.
3. Raymond Broad Lambretta, "A Practical Guide to maintenance and repair", 5<sup>th</sup> edition, S.Chand & Co., 1987.