# Course Content of Automobile IC Engine Workshop

## Session 1: Introduction to basic engine design

## Introduction

- *What is an automobile?*
- *Brief history.Changes over the years.*
- *Indian automobile industry.*

## Chassis design

## 1. Brief terminology –

- *Multi point strut bar.*
- *Fender bar.Anti-roll bar.*
- *Monocoque.*

## 2. Types of chassis –

- *Ladder frame chassis.*
- *Tubular space frame chassis.*
- *Monocoque frame chassis.*
- *Ulsabmonocoque.*
- *Backbone frame chassis.*
- *Aluminium space frame.*
- *Carbon fibremonocoque.*

## Suspension unit

## 1. Brief terminology –

- *Weight Transfer*
- *Jacking forces*
- *Camber and Caster angle*
- *Spring Rate*
- *Travel*
- *McPherson Strut*

## 2. Types of suspensions –

- Dependent suspension
- Independent suspension

## Session 2:
## Steering system

- Ackerman Steering Principle
- Steering Mechanisms
- Rack and Pinion
- Recirculating Ball Type
- Worm and Sector
- Understeer, Oversteer
- Power Steering

## Transmission system

- Flywheel
- Clutch
- Single Plate Clutch
- Multi Plate Clutch
- Cone Clutch
- Centrifugal Clutc
- Electromagnetic Clutch
- Gearbox
- Constant mesh type
- Synchromesh type
- Sliding mesh type
- Reverse and its working
- Types of Transmission
- Manual
- Semi-Automatic
- Automatic
- CVT
- Differential
- 2WD, 4WD, AWD
- Tyres
- Tyre size notations
- Tyre types
- Traction Control

### *Session 3*

### *Braking unit*

- *Disc Brakes*
- *Drum Brakes*
- *Magnetic Brakes*
- *Vacuum Brakes*
- *Anti-lock braking System*
- *4-Channel, 4-Sensor ABS*
- *3-Channel, 3-Sensor ABS*
- *1-Channel, 1-Sensor ABS*
- *Brake Actuators*
- *Cable operated*
- *Solid Bar connection*
- *Single-circuit hydraulic*
- *Dual-circuit hydraulic*
- *Power Brakes*
- *Brake Fluids*

## *Fuel supply system*

- *Fuel Filter*
- *Carburettor*
- *Fuel Injector*
- *Spark Plug*

## *IC Engine*

- *Types of IC Engine*
- *4-Stroke Engine*
- *2-Stroke Engine*
- *Engine Layout and working*
- *Valves and Valve Timing*
- *Engine Cooling*
- *Turbochargers*

- *Superchargers*
- *Latest Technologies*
- *PGMFi*
- *MPFi*
- *CRDi*
- *VVTi*

## *Session 4*

## *Live demonstration –*

- *IC Engine Dismantling and Assembling*

## *Project to be covered*

- *Part designing using Software (Any Two)*
- *Piston*
- *Connecting Rod*
- *Crank Shaft*
- *Engine Body*