A two days workshop on Automobile Mechanics & IC Engines

Session 1:

Automobile & Designing Session (Expected Session Duration: 1.5- 2.0 hours with Presentations, Demonstrations etc)

1. Introduction to Automobile Mechanics
2. Locomotive Vehicles
3. Chassis design Brief terminology

1. Multipoint Strut Bar
2. Fenderbar
3. Anti Roll Bar
4. Monocoque
5. Tubular Space
6. Longeron RH,LH

Types of chassis

1. Ladder Frame Chassis
2. Tubular Space Frame Chassis
3. Monocoque Frame Chassis
4. Ulsab Monocoque
5. Backbone Frame Chassis
6. Aluminium Space Frame
7. Carbon Fibre Monocoque

Session 2:

Suspension Session (Expected Session Duration: 1.5- 2.5 hours with Presentations, Demonstrations etc) Suspension Unit Brief terminology

1. Weight transfer sprung and unsprung)
2. Jacking forces
3. Camber and caster angle
4. Anti dive & anti squat
5. Spring Rate
6. Travel

Types of suspensions

1. Dependent suspension
2. Independent suspension

Front Independent Suspensions

1. McPherson Strut
2. Double wishbone
3. Coil Spring type1
4. Coil spring type2
5. Multi link type
6. Trailing arm suspension
7. I beam suspension

Rear suspension - dependant systems

1. Solid-axle, leaf-spring
2. Solid-axle, coil-spring
3. Beam Axle

Hydragas Suspension Hydropneumatic Suspension Progressively wound springs Torsion bars

Session 3:

Braking Unit Session (Expected Session Duration: 1- 1.5 hours with Presentations, Demonstrations etc)

Braking Unit Disc brakes

1. Self adjusting nature
2. Disc damage modes
3. Servicing your disc

Drum brakes Anti-lock braking system

1. Four-channel, four-sensor ABS
2. Three-channel, three-sensor ABS
3. One-channel, one-sensor ABS

Brake Actuators

1. Cable-operated
2. Solid bar connection
3. Single-circuit hydraulic
4. Dual-circuit hydraulic
5. Brake-by-wire

Session 4:

Transmission Session (Expected Session Duration: 2- 2.5 hours with Presentations, Demonstrations etc) Transmission system Manual transmission

1. Gear ratio
2. Different types of gear
3. Clutch & its components
4. Reverse & its working

Automatic transmission

1. Planetry gearsets
2. DSG / DCT Gearboxes

Torque Converters

1. Semi automatic Transmission
2. Continuously variable transmission

Session 5:

Differential & Traction Session (Expected Session Duration: 2- 2.5 hours with Presentations, Demonstrations etc)

Differentials
Differentials
Open Differentials
Limited-slip differentials
Locking differentials
2WD, 4WD, AWD

Tyres and Traction Control
Tyre size notations
Tyre types for passenger cars
Tyre constructions
- Cross-ply construction
- Radial construction

Tyre tread
Traction & its control

Session 6:

IC Engine Session (Expected Session Duration: 3- 3.5 hours with Presentations, Demonstrations etc)

IC Engines Types
- Compression ignition
- Spark ignition

Layout
Engine balancing
Spark plug
Carburettor
Fuel injector
Valves & valve timing
Valve trains
Engine cooling
Turbochargers
Superchargers
Air/Fuel ratios
Wankel Engine (6 stroke)

Session 7:

Electronics & Safety Session (Expected Session Duration: 1 – 1.5 hours)

Engine Sensors
Microcontrollers and applicable sensors
Electronics Usage and Feedbacking for vehicle analysis and control
Airbag System
Seat Belt System

Prerequisites & Eligibility

This is a basic level workshop and anybody is eligible to join this workshop. The course and curriculum of this workshop is more inclined towards Mechanical/Automobiles department however anybody can join this workshop even from different department. Mode of Training/Teaching will be English only.

Note: Important: Course & Structure of Workshop may subject to change without any notification to host institution.