



Automobile

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

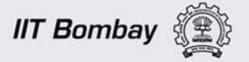
Brief terminology

- 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

Demonstration on

Bike Engine Dis-Assembling / Re assembling

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