



PRESENTS

“Winter Internship Program”  
Automobile Engine Design

Duration 15 Days

Kit Partner

**ROBOMART.com**

Corporate Office

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Course Name : **Automobile Engine Design**  
Certification : By Robosapiens Technologies Pvt. Ltd.  
Fee : 7900/- Only

LIVE Projects Covered : **Hands on Session**

## **Detailed Course Content**

### **1. Introduction (1 Hr.)**

- 1.1. What is an automobile?
- 1.2. Brief history
- 1.3. Changes over the years
- 1.4. Indian automobile industry
- 1.5. Sigma ratings

### **2. Chassis Design**

- 2.1. Multi point strut bar
- 2.2. Fender bar
- 2.3. Anti-roll bar
- 2.4. Monocoque
- 2.5. Tubular space
- 2.6. Longeron rh, LH

### **3. Types of chassis**

- 3.1. Ladder frame chassis
- 3.2. Tubular space frame chassis
- 3.3. Monocoque frame chassis
- 3.4. Ulsab monocoque
- 3.5. Backbone frame chassis
- 3.6. Aluminium space frame
- 3.7. Carbon fibre monocoque

## **4. Suspension Unit**

- 4.1. Weight transfer (sprung and unsprung)
- 4.2. Jacking forces
- 4.3. Camber and caster angle
- 4.4. Anti-dive & anti squat
- 4.5. Spring Rate
- 4.6. Travel

## **5. Types of suspensions**

- 5.1. Dependent suspension
- 5.2. Independent suspension
- 5.3. Front Independent Suspensions
- 5.4. McPherson Strut
- 5.5. Double wishbone
- 5.6. Coil Spring type1
- 5.7. Coil spring type2
- 5.8. Multi-link type
- 5.9. Trailing arm suspension
- 5.10. I beam suspension
  - 5.10.1. Rear suspension - dependant systems
- 5.11. Solid-axle, leaf-spring
- 5.12. Solid-axle, coil-spring
- 5.13. Beam Axle
  - 5.13.1. Hydra gas Suspension
  - 5.13.2. Hydro pneumatic Suspension
  - 5.13.3. Progressively wound springs
  - 5.13.4. Torsion bars

## **6. Braking Unit**

- 6.1. Disk Brakes
  - 6.1.1. Self-adjusting nature
  - 6.1.2. Disc damage modes
  - 6.1.3. Servicing your disc
- 6.2. Drum brakes

6.3. Magnetic brakes

6.4. Vacuum brakes

## **7. Anti-lock braking system**

7.1. Four-channel, four-sensor ABS

7.2. Three-channel, three-sensor ABS

7.3. One-channel, one-sensor ABS

## **8. Brake Actuators**

8.1. Cable-operated

8.2. Solid bar connection

8.3. Single-circuit hydraulic

8.4. Dual-circuit hydraulic

8.5. Brake-by-wire

8.5.1. Power Brakes and master cylinders

8.5.2. Brake fluids

## **9. Designing Using Software- Basics of AutoCAD & CATIA V5**

9.1. Drawing, modifying & dimensions in AutoCAD

9.2. Sketching & Part modelling in CATIA.

## **10. Transmission system**

### **11. Types of Transmission system**

11.1. Manual transmission

11.1.1. Gear ratio

11.1.2. Different types of gear

11.1.3. Clutch & its components

11.1.4. Reverse & it's working

11.2. Automatic transmission

11.3. Semi-Automatic Transmission

11.4. Continuously variable transmission

## **12. Differentials**

- 12.1. Open Differentials
- 12.2. Limited-slip differentials
- 12.3. Locking differentials
  - 12.3.1. 2WD, 4WD, AWD

## **13. Tires and Traction Control**

- 13.1. Tire size notations
- 13.2. Tire types for passenger cars
- 13.3. Tire constructions
- 13.4. Cross-ply construction
- 13.5. Radial construction
- 13.6. Tire tread
- 13.7. Traction & its control

## **14. IC Engines**

- 14.1. Types
- 14.2. Compression ignition
- 14.3. Spark ignition
- 14.4. Layout
- 14.5. Engine balancing
- 14.6. Spark plug
- 14.7. Carburetor
- 14.8. Fuel injector
- 14.9. Valves & valve timing
- 14.10. Valve trains
- 14.11. Engine cooling
- 14.12. Turbochargers

## **Hands-On Practical Session**