



**Course & Kit Content
Of
Automobile Engine Design**

Duration 7 Days

Kit Partner

ROBOMART.com

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Course Name : Automobile Engine Design
Certification : By Robosapiens Technologies Pvt. Ltd.
Fee : Rs. 5900/- Only

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. Aluminum space frame

3.7. Carbon fiber 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 - dependent 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 (Basic Level).

9.2. Sketching & Part modelling in CATIA (Basic Level).

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

12. Differentials

- 12.1. Open Differentials
- 12.2. Limited-slip differentials
- 12.3. Locking differentials

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

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

Hands-On Practical Session

