

EZENITH EDUCATION INTERNSHIPS



CADI

COMPREHENSIVE AUTOMOBILE
DEVELOPMENT INTERNSHIP

Ezenith Education Internships

India's Biggest Internships
65 Hours of Extensive Knowledge Transfer

Day 1

- Basics of I.C.Engines - Evolution, Classification and Applications
- Components of I.C.Engines – Function, Materials and Failure Modes
- Intake & Exhaust Manifold Design and Simulation Demonstration
- S.I and C.I Engines – Valve Timing, Heat Release and Combustion Analysis
- Advanced IC Engines- MPFi CRDi, TDi, HCCI
- Gasoline Direct Injection (GDI)
- Turbocharging –Types & Comprehensive Theory Compressor Maps, Turbo Matching & Failure Modes
- Advanced Two-Wheeler Technologies – Twin Spark, Triple Spark, APDV/ASFS/ATFT, Start-Stop
- "GROUP Project Allotment"

Day 2

- Engine Downsizing – A Brief Study
- S.I and C.I Engine – Emission Analysis and Emission Control Technology- BS4 to BS6
- Automotive Transmissions- Manual & Automatic, Drivetrain Components, Differential Tech.
- Concepts & Calculations of Drivetrain (Road Loads and Tractability, Gear Ratios, Air Drag)
- Elementary Tire Patch Forces and Moments: Forces and Moments at the Tire Contact Patch
- Powertrain System Dynamics required to produce vehicle motive force at the tire patch
- Performance prediction in acceleration and fuel economy
- Automotive Transmissions
- Concepts & Calculations of Drivetrain (Road Loads and Tractability, Gear Ratios, Air Drag)

Day

- Practical Hands-on Experience via Assembly & Disassembly Car and Bike Engines.

Comprehensive Automobile Development Internship

3

- Demonstration session on Engine Components- EGR, Turbo, Fuel Pump & Rail, Oil Filter-Cooler,
- Intercooler, Intake Manifold, ECU, Injectors, Catalytic Converter.

Day

4

- Practical Hands-on Experience on Automotive Transmissions Systems
- Layout of the Chassis and its main Components/Members
- Functions & Types of the Chassis Frame
- Chassis Integration, Design Parameters & Material Selection
- Different types and Requirements of Bodies used in automobiles
- Aerodynamics Consideration for Body Designing
- Analytical Demo- Impact Structure Design Parameters, Testing Methods and Product Cost Estimation

Day

5

- Introduction & Effective Metrics for Vehicle Dynamics.
- Vehicle system, subsystem and piece-part metrics used to link vehicle dynamics to vehicle system design and development: bounce frequencies, lateral acceleration gain, understeer gradient, roll gradient, roll stiffness, etc.

Brakes

- Brake system Anatomy and Architecture
- Braking Dynamics: Braking Forces, Weight transfer, Centre of Gravity, Brake force distribution, stability, Pedal force gain, Brake proportioning and Braking efficiency.
- Brake System Performance Prediction
- Stopping Distance -- Actual vs. magazine; Contributions of Subsystems; Effects of Driver.
- Thermal management -- Conservation of Energy; Design for max speed vs. high use
- Brake Balance and System Output Calculations for different Conditions

Advanced Braking

- Anti-lock Braking Systems & EBD
- Performance Panic brake assist.
- Hybrid/regenerative braking

Practical Hands-on and Demonstration Session on Braking System.

Day

6

Suspension System

- Suspension System Anatomy & Performance requirements relative to Drive-off, Braking, Ride and Handling
- Solid live axles, twist beam suspensions and independent suspensions
- Side view pitch poles and pitch axis considerations: anti-squat and anti-dive suspension geometry, wheel travel and caster geometry.

- Role axis considerations: roll center location, roll axis geometry and location, wheel travel and toe geometry, wheel travel and camber geometry.

Steering Systems

- Steering system Anatomy, architecture and performance requirements
- Steering geometry, wheel geometry, steering system forces and moments, steering ratio, steering compliance
- Experimental methods for steering system performance evaluation and development
- Roll-Over Fundamentals
- Suspension system and steering system considerations

Practical Hands-on

Demonstration of various suspension and steering system components.

Ride Fundamentals Case Study – Software Demonstration:

- Straight line and Cornering: Input excitation signals: road roughness, vehicle sources (tire/wheel system, driveline and engine), Vehicle response properties: suspension isolation, tire vertical stiffness, spring rate ratio, suspension stiffness, ride rate, suspension damping, pitch and bounce frequencies

Day 7

- Embedded controls systems in Automobile
- Computer based controls in Automobiles
- Practical Session on ECU Kit Demo, Engine Electronics - Inlet to Outlet Sensors & Actuators, OBD.

NVH & Safety Systems

- Noise Reduction Techniques in Automobiles
- Driver Assistance Systems – Lane Departure Warning Sys, Predictive Emergency Braking Sys, Adaptive Cruise Control, Blind Spot, Night Vision Camera, Advanced Forward Lighting systems, Airbags.

Day 8

- "Industrial Project Review"
- Interview Skill's and Further Career Development Q&A
- Resume Writing & Interview Tips – What the Industry Looks For?
- Certification & Closing Ceremony.