

## **Electric Vehicle Design & Technologies (EVDT)**

**30 Days 80\* hours Intensive Certified Internship**

**India's First ever course work based Internship on**

**Electric Vehicle Design, Technologies, Engine Electronics, Vehicle Electronics and Intelligent Vehicle Technologies.**

No of Days: 30

No of Hours: Total 80 (40 Expert\_led Live Training + Assignment Hrs) + (40 Hours on Project Assigned)

**The course is divided into four diff. areas of Automotive EV & Electronics**

- **Alternative Vehicle Propulsion**
  - Electric Vehicle, Hybrid Electric Vehicle, Battery, BMS, Electric Motor design, Charging Systems, Battery pack design, EV Vehicle Dynamics, Power electronics in EV.
- **Engine Electronics**
  - Electronics in Engine systems – Various Sensors, Actuators, Fuel Injection, Emission control, NVH systems.
- **Vehicle Electronics**
  - Electronics in Vehicle systems – suspension, steering, body, chassis, safety, infotainment, comfort and convenience features.
- **Intelligent Vehicle Technologies (IVT)**
  - Electronics in Vehicle systems – Driver Assistance Systems, Connected Cars, Vehicle IoT.

### **Hybrid & Electric Vehicle Design**

- Hybrid Vehicle Technologies
- Hybrid Electric Vehicles (HEV)
- Electric Vehicle Technologies (EV)
  - Electric Motor Design
  - Various Modern Battery Technologies
  - Battery management System
  - Battery chargers and how it is designed
  - Battery Pack design
  - Understanding Electrical Wiring and various other layouts.

- Power electronics in EV and its advancements.
- EV Vehicle dynamics calculation and various tools.

### Electric Vehicle Simulation in MATLAB

- Understanding MATLAB environment.
- Understanding Mathematical modelling behind Simulation
- Various tools used for simulation in MATLAB
- Performing basic simulation in MATLAB
- Performing EV simulation or modelling in MATLAB

### Engine Electronics

- Sensors used in Engine (Inlet to After Treatment)
- Working of Various Sensors
- Engine Management Systems – Overview
- Controlling sensors through microcontrollers (Arduinio or PIC)
- Engine Performance Optimization using Electronics Systems
- Engine Emission Optimization techniques using Electronics Systems
- Electronic Fuel Injection Technologies
- Noise Vibration & Harness (NVH) Systems in Modern Automobiles.
- Advanced Electronics Systems – Valve train, Fuel Delivery Systems.

### Vehicle Electronics

- Introduction to Vehicle Electronics Systems
- **Safety:** Airbags – System Introduction and working
  - Automotive Safety Systems
  - Active and Passive Safety System
  - Regulatory Requirements - ABS, ESP, Air Bag Controls
- **Dynamic Suspension** – Electronic Stability Program (ESP) & Traction Control
- **Steering** – Power Steering systems
- **Breaking** – Anti Lock Breaking System (ABS)
- **Dynamic Breaking** – Electronic Break force Distribution (EBD) & EBA Systems.
- **Automatic Transmission** - Transmission Control Module (TCM) & Paddle Shifters & Dual Shift Gear Box (DSG) by Volkswagen
- Adaptive Cruise Control (ACC) Systems
- Introduction to On board Diagnostic (OBD) & DLC
- Demo of diff. systems in live as well as in simulator.

## Intelligent Vehicle Technologies (IVT)

These systems are mainly helping drivers and providing enhanced driving experience as well as enhanced safety for passengers in current automobiles

### Advanced Driver Assistance Systems

- Lane departure warning System (LDWS)
- Predictive Front Collision Warning (FCW) (Camera & Radar Based)
- Smart Key
- Blind Spot Warning
- Night Vision Camera
- Automotive Infotainment Systems

### Connected Cars – Vehicle IoT

- Systems Monitoring
- Predictive Maintenance
- Smart Driving Assistance
- Driver Safety Systems
- Emergency Systems
- Future Scope of the Technology.

## Design Project/Challenge – 15 Days

Students will be allotted in a team and assigned a work station and a specific design Problem statement/Portfolio design on 16th day of the program and mentored by our Experts/designers and facilitators. Last Day all requested to present their solutions to Industrial Jury The best design project will be awarded a prize and the team will receive excellence certification.

### Portfolio/Project presentation

- Best Teams will be selected and awarded “Winner of EVDT Challenge” with prizes.
- Best Students who perform well throughout the Program will get “Best Intern Award” and certificate of Excellence.
- Best Portfolio will be awarded Design Excellence Award.

**Note:** Expertshub has all rights to change the structure of the program based upon expert’s availability and lab conditions without prior notification to anybody.

\*no of hours mentioned are calculated by Live Online Training, Assignments & the time student spend on project work.

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