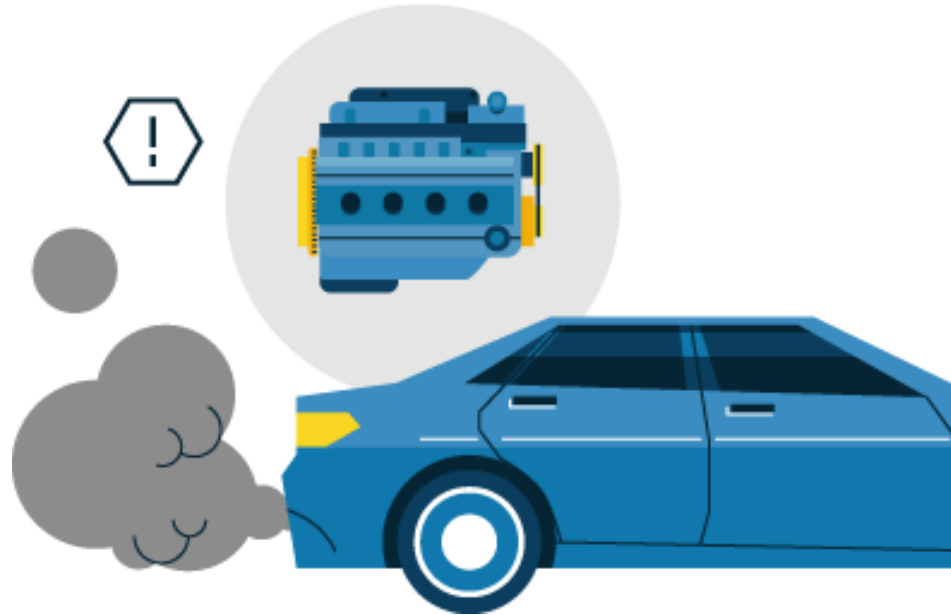




THE ANNUAL TECHNO-MANAGEMENT FEST, IIT (BHU) VARANASI

TECHNEX'21

02-04 APRIL, 2021



Automobiles & Electric Vehicles

Online Internship & Training Program

LIVE ONLINE TRAINING
4-6-8 Weeks / 30 hours

Official Partner



EISYSTEMS SERVICES

FF-113, Express Greens Plaza, Sector 1
Vaishali, Ghaziabad (Delhi NCR), Uttar Pradesh -201010
P: +91 9773976977 | E: info@eisystems.in | W: www.eisystems.in



Prerequisites

Participants from ME/Production/Automobiles background are eligible to join this program.

What you are required to have before starting this training program?

We expect participant to have

1. A laptop with Microsoft Windows configuration & smartphone.
2. Laptop Charger/ Adapter for charging purpose.
3. USB Mouse for designing purpose (if required).
4. Internet Connectivity.

Post Training Deliverables

Every participant will get all under mentioned deliverables

1. 30 hours online training by specialized trainer.
2. Certificate of Internship from Technex IIT (BHU) Varanasi.
3. Guidance for Entrepreneurship in chosen field or employment support (if asked).
4. Chance to assist our trainer in our workshop(s) at IISc, IITs, NITs etc.

Content Outline

Session 1

Introduction to this program

About Automobile Mechanics

About Engines

Why EISystems Technologies only?

Expectations from this training program.

Possibilities in future.

Session 2

Basic Automobile & Designing

1. Introduction to Automobile Mechanics

2. Locomotive Vehicles

3. Chassis design

4. Brief terminology

Multipoint Strut Bar

Fenderbar

Anti Roll Bar

Monocoque

Tubular Space

Longeron RH,LH

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5. Types of Chassis

- Ladder Frame Chassis
- Tubular Space Frame Chassis
- Monocoque Frame Chassis
- Ulsab Monocoque
- Backbone Frame Chassis
- AluminiumSpace Frame
- Carbon Fibre Monocoque

Session 3

Suspension Unit Brief terminology

1. Weighttransfer sprung and unsprung
2. Jacking forces

Camber & Caster Angle

Anti Dive & Anti Squat

Spring Rate

Travel Types of suspensions

Dependent Suspension

Independent Suspension

- Front Independent Suspensions

 - McPherson Strut

Double Wishbone

Coil Spring type1

Coil Spring type2

Multi link type

Trailing Arm Suspension

Beam suspension

Rear suspension - Dependant Systems

Solid-axle, leaf-spring

Solid-axle, coil-spring

Beam Axle

Hydragas Suspension

Hydropneumatic Suspension

Progressively wound springs

Torsion bars

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Session 4

Braking Unit

Disc brakes

1. Self adjusting nature
2. Disc damage modes

Servicing your disc Drum brakes

Anti-lock Braking System

Four-channel, Four-sensor ABS

Three-channel, Three-sensor ABS

One-channel, One-sensor ABS

Brake Actuators

Cable-Operated

Solid Bar Connection

Single-Circuit Hydraulic

Dual-Circuit Hydraulic

Brake-by-Wire

Power Brakes and Master Cylinders

Brake fluids

Session 5

Transmission

Gear ratio

Differenttypes of gear

Clutch & its components

Reverse & ilk working

Automatic transmission

Planetarygearsets

DSG / DCT Gearboxes

Torque Converters

Session 6

Differential & Traction

Open Differentials

Limited-slip Differentials

Locking Differentials

2WD, 4WD. AWD

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Tyres and Traction Control
Tyre size notations
Tyre types for passenger cars
Tyre constructions
Cross-ply construction
Radial Construction
Tyre Tread
Traction & its control

Session 7 & 8

IC Engines Session
Types
Compression ignition Spark ignition
Layout
Engine balancing
Spark Plug
Carburetor
Fuel Injector
Valves & Valve Timing
Valve trains
Engine Cooling
Turbochargers & Superchargers

Session 9

Virtual Engine Dis-assembly Session

Session 10

Software & Designing Session.

Session 11 (Optional - Subject to Availability)

Car Module Identification

Session 12

Technology Session
Latest Technologies
PGMF1
DTS.fi MPFI CRDI RTR
I-Vtec & Tem
Airbags & Steering System

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Session 13

Electric Vehicles -1

Introduction

Systems Integration and Analytical Tools

Vehicle Development Process Overview

Requirements Development

Hybrid Components and Architectures

Vehicle and Charging Standards

Electric Vehicle Supply Equipment (EVSE) Descriptions

Governing Bodies for Regulations

Certification Requirements and Options

Battery Management Systems

Block Diagram - Main Functions of a BMS

Sensing Requirements

Cell/module level: cell voltage, cell/module temperature, (humidity, smoke, air/fluid flow)

Pack level: current, pre-charge temperature, bus voltage, pack voltage, isolation

Control Requirements

Contact control, pre-charge circuitry

Thermal system control

Cell Balancing: Active versus passive, strategies

Session 14

Electric Vehicles -2

Electrochemistry and Battery Materials Design

Electrochemical Principles of Energy Storage Systems

General Overview; Physics and Chemistry of Advanced Lithium Battery Materials

Future Trends and New Concepts in Battery Materials and Design

Power Electronics

Introduction - Why Power Electronics?

Overview of Power Density

Effects of air vs. liquid cooling

Effects of efficiency

Converter Topologies

Buck, boost, transformer

Power Semiconductors

Insulated Gate Bi-polar Transistor (IGBT)

Metal-Oxide-Silicon Field Effect Transistor (MOSFET)

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Session 15

Electric Vehicles -3

Electric Motors

Force/Torque Production Non-Linear magnetic material behavior Losses and Efficiency Fundamental Theory, Performance, Construction & Control
Transformers Synchronous Machines
Wound-field Permanent Magnet Reluctance Machine
Switched Reluctance Synchronous Reluctance Flux Modulating Machines
Machines on-Electromagnetic Design & System Considerations

Session 16

Electric Vehicles -4

Lithium-Ion Battery Design

Overview of Battery Design

Major Cell Components

Overview of Battery Modeling and Simulation

Lithium-Ion Cell Design Example

Thermal Management for Batteries and Power Electronics

Battery Heat Transfer

Thermal Management of Power Electronics

Disclaimer

Please make sure that IIT (BHU) Varanasi is nowhere charging any amount from any participant and this training/internship will be organised by EISystems Services in association with Technex, an annual techno-management festival of IIT BHU Varanasi, it is to note that Technex is only responsible for providing certification to attending students and rest of the matters like marketing, operations, publicity, scheduling, payment processing, content development etc. will be taken care by EISystems Services.

All of the matters/disputes related to internship/training needs to be addressed to EISystems Services only. See our terms and conditions on www.eisystems.in/tnc.php and fees once paid is non refundable and non transferrable. Company reserves full right to withdraw any offer anytime without any prior notification, Also it is important to understand that center of internship in Varanasi will not be IIT (BHU) Varanasi and it will be at some other place in Varanasi itself.

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