ISIEINDIA

Post Graduation Program in

EV INTELLIGENT SYSTEM

Get the whole picture

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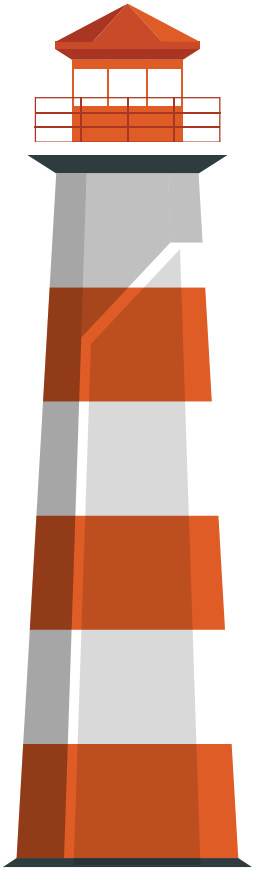
About ISIEINDIA

With more than 1 Million+ learners in 20+ countries, ISIEINDIA, is a leading global edtech company for professional and higher education offering industry-relevant programs in blended and purely online modes across technology domains. Our Programs are Industry oriented to enhance the technical skill sets and to create a sustainable career path for learners.



Our Mission

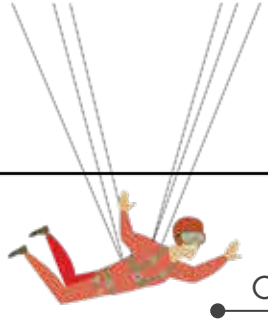
Enabling career success in the Automotive Industry

As India's largest professionals and engineering students learning company and a global footprint in 20+ countries, we're on a mission to make professionals around the globe proficient and future-ready.

Our Vision

A world with skilled automotive ecosystem

To create sustainable training platform leading to provide an opportunity to the every member of automotive workforce.



250+
City Learner Base

Why ISIEINDIA

300%
Highest Salary Hike

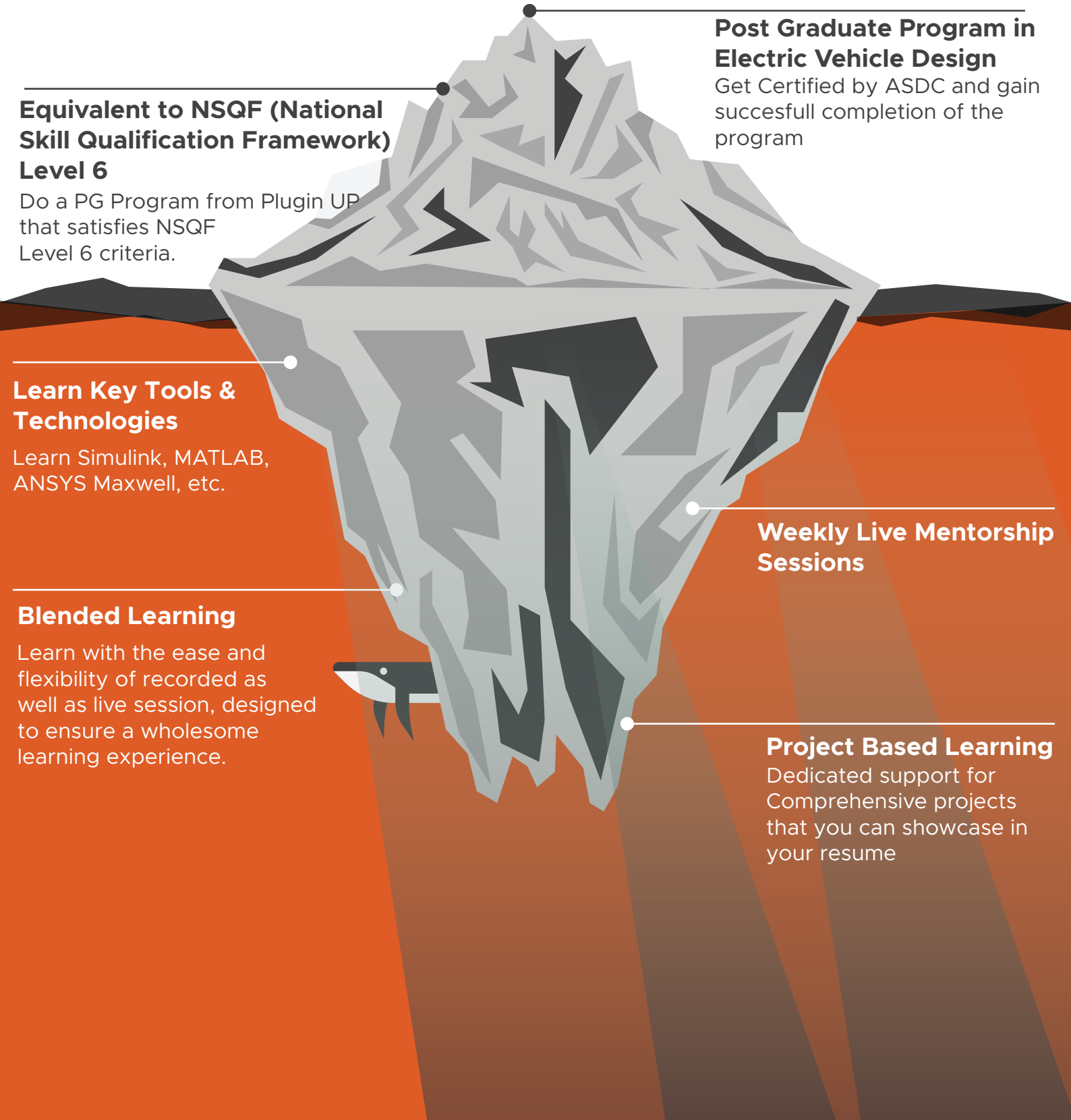
60%
Average Salary Hike

300+
Hiring Partners

1+ Million
Learners

350+
Industry Experts

Program Highlights



Post Graduate Program in Electric Vehicle Design
Get Certified by ASDC and gain succesfull completion of the program

Equivalent to NSQF (National Skill Qualification Framework) Level 6
Do a PG Program from Plugin UP that satisfies NSQF Level 6 criteria.

Learn Key Tools & Technologies
Learn Simulink, MATLAB, ANSYS Maxwell, etc.

Weekly Live Mentorship Sessions

Blended Learning
Learn with the ease and flexibility of recorded as well as live session, designed to ensure a wholesome learning experience.

Project Based Learning
Dedicated support for Comprehensive projects that you can showcase in your resume

Faculty and Industry Experts

G Leela Mohan Rao
Associate Software Engineer
accenture

Boris Fabris
Automotive Design Consultant

Priya Parameswarappa
Buisness System Manager
SIEMENS

Manish Kumar
Assistant Manager, R&D
TVS

Rahul Bollini
R&D Consultant for Li-Ion Battery
ISIE INDIA

Ketan Kumar Jangra
Assistant Manager
JBM Group

ISIEINDIA Learning Experience

Student Support Team

- We have a dedicated Learner Support Team for handling your queries via email or callback request.
- This support is available from Monday to Saturday between 09:00 AM to 07:00 PM

Expert Feedback

- Personalized expert feedback on assignments and projects
- Regular live sessions by experts to clarify concept related doubts

Industry Networking

- Live Sessions by expert on various industry topics.
- One-on-one discussion and feedback sessions with industry mentors

Industry Mentor

- Receive unparalleled guidance from industry mentors, teaching assistants and graders
- Receive one-on-one feedback on submissions and personalised feeback on improvements

Q&A Forum

- Timely doubt resolution by industry experts and peers
- 100% expert-verified responses to ensure quality learning

Learning Path

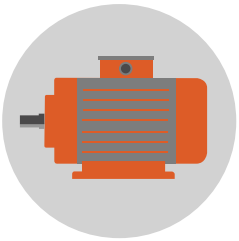
Course Orientation
0 Week

Learn 6 Specializations
1 Weeks to 32 Weeks

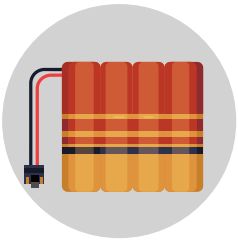
4 Major Projects
33 Week to 37 Week

Placement Drive
38 Week to 44 Weeks

Electric Machine Design
4 Units, 5 Weeks

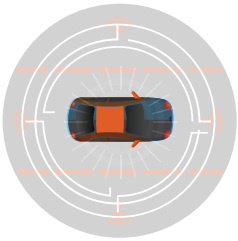


Electric Motors and Drives
4 Units, 6 Weeks



Power Unit Design and Safety
4 Units, 6 Weeks

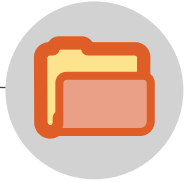
EV Communication & Diagnosis
4 Units, 5 Weeks



EV Communication & Connected Technology
4 Units, 7 Weeks

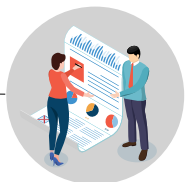
32 Assignment
Every week to analyse the performance

16 Case Study
To analyse the learning performance

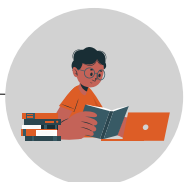


4 Mini Projects
To get the significant, immediate result of learning

Live Sessions
Monthly Live Sessions with Industry Experts



16 Assessments
Every alternative week to analyse the performance



Online Classes
120+ Hours of Online Learning

Post Graduate Program in EV Intelligent System

COURSE CURRICULUM

MODULE 1 : ELECTRIC MACHINE DESIGN & INDUSTRY PROSPECTS

UNIT 1. ABOUT EV INDUSTRY AND MARKET STUDY

1. Coming of EV in 19th Century
2. Golden Era of EV
3. Coming of New Era in EV
4. EV Market and Sales
5. Components; Trends and Growth
6. HEV Architecture – Parallel Hybrid
7. Series Hybrid
8. Series Parallel
9. Fuel Cell EV
10. Selection on Motors, their Size and Types
11. Transmissions
12. Hub Motor
13. Battery Performance Index : Battery
14. Expert Lecture (Live)

UNIT 2. EV ARCHITECTURES AND TYPES

1. Construction of Electric Vehicles-EV
2. Construction of Hybrid Vehicle-HEV and Types
3. Complete Vehicle System Modelling & Drive Cycle Simulation- Using Ricardo Ignite
4. Type of Drive Train
5. Selection of Drive Train
6. Expert Lecture (Live)

UNIT 3. POWERTRAIN SELECTION

1. Vehicle Coordinate System
2. Powertrain Equation
3. Drag Equation
4. Drag Coefficient
5. Drag Calculation
6. Tire Constrcution and Specification
7. Wheel Rolling without Slipping
8. Wheel Dynamics ROLL vs SLIP vs SKID
9. Contact Patch
10. Hysteressis Loss
11. Tyre Parameters
12. Calculating Parameters
13. Power Calculation
14. Torque Calculation
15. Gearbox Selection
16. Motor Characteristics

UNIT 4. MODEL BASED SIMULATIONS-DRIVE CYCLE AND TRANSMISSION EFFICIENCY

1. Basics of EV, EV/HEV Powertrain & Introduction to MATLAB for Automotive
2. Basic GUI for MATLAB
3. Discrete and Dynamic Systems
4. Powertrain Blockset and Examples
5. Vehicle modelling - 1
6. Vehicle modelling - 2
7. Expert Lecture (Live)

MODULE 2 : ELECTRIC MOTORS AND DRIVE METHODS

UNIT 1. MOTOR TYPE FOR EV

1. Introduction of DC Motor
2. Working Principle
3. Types of DC Motor and Calculation
4. Speed Control Methods
5. Intro and Its Types
6. Rotating Mangnetic Field
7. Working Principle
8. Power Flow Diagram
9. Performance Characterstics
10. Speed Control Techniques
11. VF Control Technology
12. Rotor Resistance Control Method
13. Working Principle and Calculation of BLDC and PMSM Motor
14. Expert Lecture (Live)

UNIT 2. MOTOR SELECTION

1. Calculating Parameters
2. Power Calculation
3. Torque Calculation
4. Gearbox Selection
5. Motor Characteristics
6. Expert Lecture (Live)

UNIT 3. MOTOR DESIGN PARAMETER

1. Basic of Magnetics
2. Maxwells Equation
3. Magnetic Circuit
4. Electro Motive Force
5. Flux Linkage and Inductance
6. Magnetic Energy
7. Electromagnetic Force and Torque
8. Electromagnetic Flux and Excitation Current
9. Winding Introduction
10. Single Layer Winding
11. Double Layer Winding
12. Rotating Magnetic Field
13. Sample Problem 2 - Winding Design
14. Phase and Line EMF
15. Sample Problem 3 - Motor Winding
16. PMSM Motor - Magnetic Properties
17. PMSM Motor - Magnetic Circuit
18. PMSM Motor - Torque Equation
19. Expert Lecture (Live)

UNIT 4. CONTROLLER ARCHITECTURE AND COMMUNICATION

1. PE and Motor Control
2. Basic Understanding of Motor
3. SRM Motor
4. Introduction of BLDC Motor
5. Control Principles
6. Regenerative Braking
7. Motor Control
8. Motor Control Quadrant
9. Ac Motor Control
10. Asynchronous vs Synchronous Motor
11. Expert Lecture (Live)

UNIT 4. MODEL BASED SIMULATION- MOTOR MAX POWER AND ENERGY CONSUMPTION

1. Introduction
2. Motor Geometry
3. Add Winding and Material
4. Simulating E Magnetics
5. Torque Speed Curve
6. Efficiency and Drive Cycle
7. Thermal Solution
8. Expert Lecture (Live)

MODULE 3 : POWER UNIT DESIGN AND SAFETY

UNIT 1. CELL TYPES AND CHARACTERISTICS

1. History of Battery Pack
2. Types of Energy Storage System
3. Why Lithium Cells?
4. Lithium Cell Working
5. Battery Terminologies
6. Lithium Chemistry
7. Lithium Cell Construction
8. Lihtium Cell Failures
9. OCV and SOC of cell
10. Linear Polarization
11. Hysteresis Voltage
12. ESC Model of Cell
11. Cell Testing and Simulation - ESC Model
12. Expert Lecture (Live)

UNIT 2. BATTERY PACK DESIGN AND CELL SORTING

1. Energy Consumption Calculation
2. Calculating Battery Pack Size
3. Cell Load Characteristics
4. Battery Pack Capacity and Voltage
5. Nickel Strip Selection
6. Bus Bar Bonding
7. Tab Bonding
8. Cell to Cell Gap

9. Spot Welding vs Laser Welding
10. Performance Design and Safety Layer
11. Safety Layer Design
12. Cell Assembly Model
13. Battery Case Design Principles
14. Battery Case Design – Model
15. Battery Pack – Component Packaging
16. Expert Lecture (Live)

UNIT 4. BMS DESIGN AND ARCHITECTURE

1. Why BMS?
2. BMS Functionality
3. Sensing Parameters
4. High Voltage Contactor
5. Isolation Circuit and Thermal Control
6. SOC, Cell Energy and Power
7. Expert Lecture (Live)

UNIT 5. CONSTRUCTIONAL AND FUCTIONAL SAFETY

UNIT 6. MODEL BASED SIMULATION - RANGE CALCULATIONS

MODULE 4 : ELECTRIC VEHICLE COMMUNICATION AND DIAGNOSTICS

UNIT 1. EMBEDDED SYSTEM IN ELECTRIC VEHICLE

1. Introduction to Embedded Systems
2. Domains of Automotive Embedded Systems
3. What is CAN Communication?
4. CAN Protocol
5. IOT & Autonomous Vehicle
6. Case study- Tesla Car
7. Expert Lecture (Live)

UNIT 2. VEHICLE CONTROL UNIT ARCHITECTURE

1. Introduction to Mathematical Model
2. Model Based Development using Mathematical Modelling
3. MBD Technology
4. Testing Automotive Control System
5. Expert Lecture (Live)

UNIT 3. CELL TYPES AND CHARACTERISTICS

1. Introduction to Micro Controller
2. Micro Controller
3. Prerequisite of Python
4. Basics of Python
5. Coding on Python
6. Numpy
7. Regressions

8. Introduction of AI
9. AI Applications
10. Expert Lecture (Live)

UNIT 4. VEHICLE DIAGNOSTICS & TROUBLESHOOTING

MODULE 5 : ELECTRIC VEHICLE COMMUNICATION AND DIAGNOSTICS CONNECTED TECHNOLOGY

UNIT 1. EVSE SYSTEMS AND TYPES

1. Introduction to EVSE
2. Safety of EVSE Infra
3. Sites & Maps
4. Related Technology
5. Expert Lecture (Live)

UNIT 2. EV CHARGING CONNECTER

1. SAE & IEC Type 1 Connectors
2. IEC62196 Connector
3. SAEJ1172 & CCS Connectors
4. Expert Lecture (Live)

UNIT 3. INTRODUCTION TO CHARGER

1. Introduction to Bharat AC & DC Charger
2. CHAdeMO Connector
3. Communication Protocol
4. Charging Methods and Algorithm
5. Expert Lecture (Live)

UNIT 4. COMMUNICATION PROTOCOL

1. OSI Introduction
2. Layered Architecture 01
3. Layered Architecture 02
4. Expert Lecture (Live)

UNIT 5. OCPP AND CSMS INTRODUCTION

1. OCPP and CSMS Introduction
2. Benefits of OCPP
3. SOAP and JSON
4. Functions of OCPP
5. Expert Lecture (Live)

UNIT 6. CHARGER TECHNOLOGIES

1. Charger Technologies
2. Intro to Power Electronics Devices
3. Switch Configurations
4. Turn Off Mechanism and Harmonics
5. AC Charging Levels
6. Expert Lecture (Live)

UNIT 7. ADAS SYSTEM

MODULE 6 : HOMOLOGATION AND TESTING

UNIT 1. INTRODUCTION TO REGULATIONS

1. Vehicle Categories
2. BOV vs EV
3. CMVR 1989 and AIS Committee
4. FVSS
5. EEC/ECE
6. Whole Vehicle Type Approval
7. Homologation for Export
8. Type of Test Tracks
9. Hardware in Loop (HIL)
10. Driving Cycle
11. Expert Lecture (Live)

UNIT 2. STATIC TESTS

1. CMVR Physical Verification
2. Tire Depth
3. Vehicle Weight
4. Horn Installation
5. Rear View Mirror
6. Tell Tales Test
7. External Projection
8. Wheel Guard
9. Foot Control Arrangements
10. Angle and Dimensions Measurement
11. Requirement of Temporary Cabin
12. Expert Lecture (Live)

UNIT 3. DYNAMIC TESTS

1. Vehicle Preparations
2. Pass-by-Noise
3. Gradeability
4. Instruments Calibration
5. Turning Circle Test
6. Steering Effort
7. Cooling Performance
8. Brake Test
9. Range Test
10. Energy Consumption Test
11. Maximum Speed
12. Acceleration Test
13. Expert Lecture (Live)

UNIT 4. VEHICLE COMPONENT TESTING & HYBRID VEHICLE RETROFITMENT AND CHARGING

1. Component Testing – Horn Test
2. Safety Glass Test
3. Windscreen Test
4. Rear View Mirror Test
5. Hinges and Latches Test
6. Demist and Defrost Test
7. Field of Vision Test
8. Powertrain Component Test – Motor Power
9. Max 30 minutes power
10. Battery Safety Criteria
11. EMI-EMC
12. Hybrid Vehicle Test – M and N Category

13. Hybrid Retro fitment Kit
14. Electric Kit for Conversion
15. Charging System– AC Charging
16. DC Charging
17. Expert Lecture (Live)

PROJECTS

PROJECT 1: POWERTRAIN EFFICIENCY OF AN EV

For a given electric vehicle create a mathematical model in order to simulate for the optimal efficiency of the system. Calculate and modify for an optimal efficiency or Wh/km energy consumption of the powertrain system.

PROJECT 2: BATTERY PACK MANAGEMENT AND DAQ

For a given performance criteria and charge and discharge cycle/ temperature profile of the battery pack choose a suitable management strategy for the system, and create the communication model for BMS with other components and data gathering system

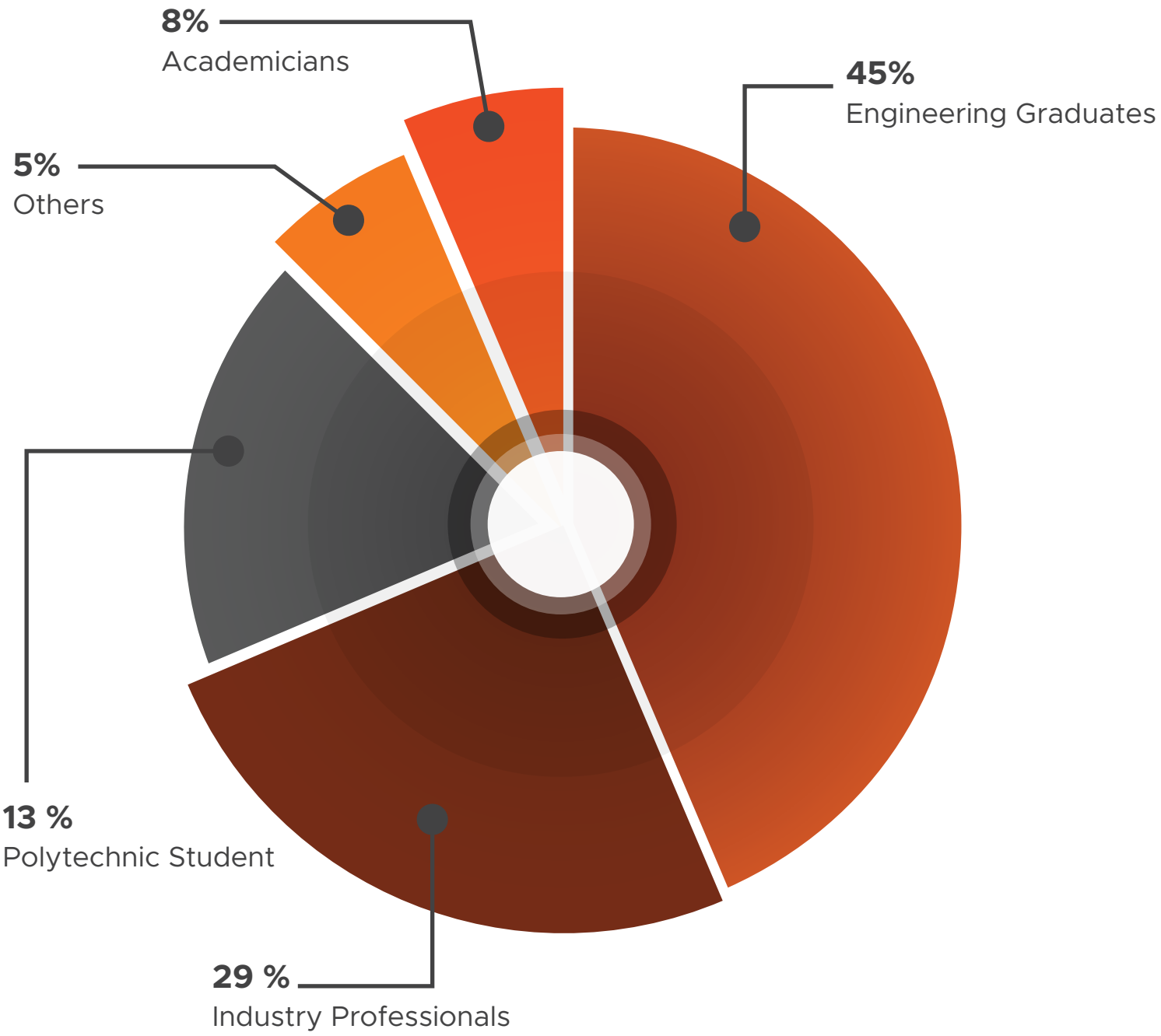
PROJECT 3: VCU AND COMMUNICATION

Perform a complete simulation of vehicle control unit/ electronic control unit for communication between high voltage components and loop. This is a model based simulation to understand the complete data gathering and communication system for an EV at vehicular level.

Note: The curriculum and projects are subject to change as per the industry experts.

Meet the Class

OUR LEARNER'S COMES FROM



Career Support

Interview Preperation

Pre-recorded content on topics such as

- Problem solving approach
- Approaching guesstimates
- Domain specific interview question bank and much more

Profile Builder

An easy to use Resume, Linedin and Cover Letter prepration tool.

- Resume Score
- Realtime recommendations to improve
- Match your resume to the JD and check fitment
- Linkedin Profile Review

Industry Readiness Assesments

Industry oriented tests which are pre--pared and validated by domain esperts.

- Detailed reports
- Industry readiness score
- Identifying strengths and helping aid in self-improvement plan for key skills

Personalised Industry Session

90-minute sessions over the weekend by leading industry experts

- Session categories: Career, Technical and Communication
- Doubt resolution
- Develop proof of concept and apply theoretical concepts in real world
- Assess skill levels
- Peer Networking
- Classroom element
- Business communication sessions and much more

Career Mentorship Sessions

Get personalised career advice through 1-1 sessions with industry experts

- Goal setting for better employment results
- Industry Readiness Assessment report discussion

1+ Million
Learners

INR 11 LPA
Highest Salary Package

300%
Highest Salary Hike

60%
Average Salary Hike

Our Alumni's Work's at

ISIEINDIA has a network of over 250+ companies who look to recruit graduates from our programs. Some of these well-known companies include.

HERO ELECTRIC The smart move | BOSCH | ASHOK LEYLAND | LARSEN & TOUBRO | ETO The Good Move

ATHER | amazon.com | Ansys | Mahindra | Cummins

KPMG | IndianOil | MG | MICHELIN | NISSAN

Program Details and
Admission Process

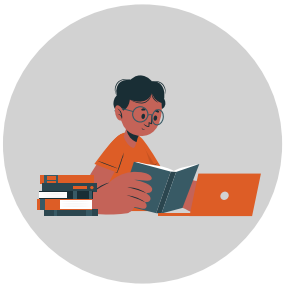
PROGRAM DURATION AND FORMAT
09 Months | Online | Live + Recorded

PROGRAM FEES
Starting at INR 11,111/month* or INR 99,999/-

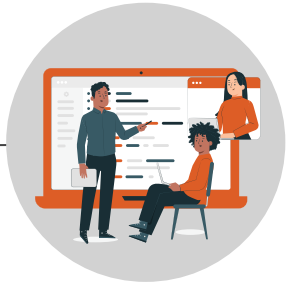
ELIGIBILITY
Minimum 1 Year of Experience

PROGRAM START DATE
Please refer to the website for program start dates.

MONTHLY COMMITMENT (31-34 hours/month)



20-22 HOURS
Asynchronous learning time



7-8 HOURS
Assignments and projects

4 Live Session
Once in a week

FOR FURTHER INFORMATION CONTACT +91-9958656343

COMPANY INFORMATION
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