

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.



Enabling career success in the Automotive Industry

Our Mission

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.

A world with skilled automotive ecosystem

Our Vision

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



Equivalent to NSQF (National Skill Qualification Framework) Level 6

Do a PG Program from Plugin UP that satisfies NSQF Level 6 criteria.

Post Graduate Program in Electric Vehicle Design

Get Certified by ASDC and gain successful completion of the program

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



Boris Fabris
Automotive Design Consultant



Priya Parameswarappa
Business System Manager



Manish Kumar
Assistant Manager, R&D



Rahul Bollini
R&D Consultant for Li-Ion Battery



Ketan Kumar Jangra
Assistant Manager



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 feedback on improvements

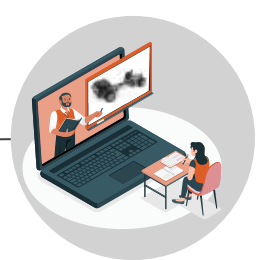
Q&A Forum

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

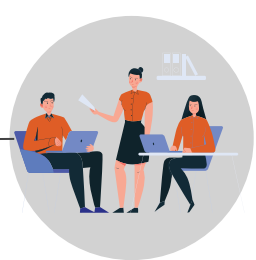
Learning Path



Course Orientation
0 Week



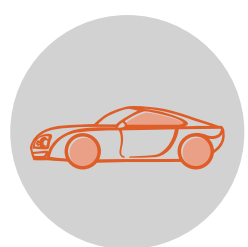
Learn 6 Specializations
1 Weeks to 32 Weeks



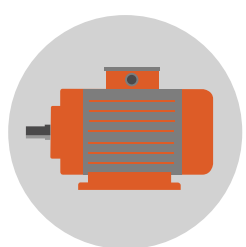
4 Major Projects
33 Week to 37 Week



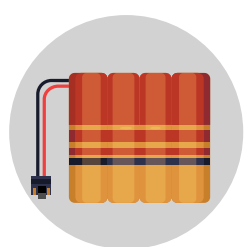
Placement Drive
38 Week to 44 Weeks



Electric Machine Design
4 Units, 5 Weeks



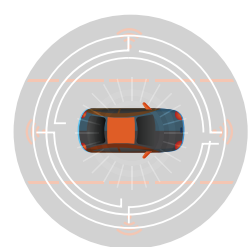
Electric Motors and Drives
4 Units, 6 Weeks



Power Unit Design and Safety
4 Units, 6 Weeks



EV Communication & Diagnosis
4 Units, 5 Weeks



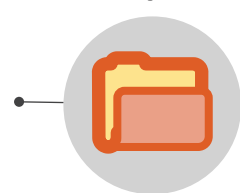
EV Communication & Connected Technology
4 Units, 7 Weeks



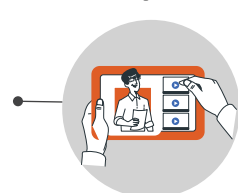
32 Assignment
Every week to analyse the performance



16 Case Study
To analyse the learning performance



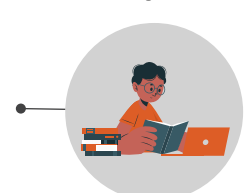
6 Mini Projects
To get the significant, immediate result of learning



04 Live Sessions
Monthly Live Sessions with Industry Experts



16 Assessments
Every alternative week to analyse the performance



Online Classes
200+ 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)

1.5 WEEK

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)

2 WEEK

UNIT 3. POWERTRAIN SELECTION

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

1.5 WEEK

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)

1.5 WEEK

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 Magnetic Field
7. Working Principle
8. Power Flow Diagram
9. Performance Characteristics
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)

1 WEEK

UNIT 2. MOTOR SELECTION

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

1 WEEK

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)

1 WEEK

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)

1 WEEK

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)

1 WEEK

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. Lithium 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)

1 WEEK

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

1. WEEK

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)

1. WEEK

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)

1 WEEK

UNIT 5. CONSTRUCTIONAL AND FUNCTIONAL 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)

1 WEEK

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)

1 WEEK

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

1 WEEK

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

1 WEEK

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)

1 WEEK

UNIT 2. EV CHARGING CONNECTER

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

1 WEEK

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)

1 WEEK

UNIT 4. COMMUNICATION PROTOCOL

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

1 WEEK

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)

1 WEEK

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)

1 WEEK

UNIT 7. ADAS SYSTEM

UNIT 3. VEHICLE CONNECTED TECHNOLOGY

1. Intro to Charging Levels and Modes
2. DC Charging Levels
3. Charging Modes
4. Charging Modes Case Study
5. Charging Levels and Modes
6. Fast Charging Intro
7. Fast Charger Safety
8. DC Charging - Region wise spread
9. DC Connectors
10. Tesla Supercharger
11. Tesla Supercharger Billing & Connectors
12. Mega Chargers
13. Smart Grid
14. Definitions 01
15. Definitions 02
16. Smart Grid Features
17. V2G Technology
18. Expert Lecture (Live)

1 WEEK

Post Graduate Program in EV Designing

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.

1 WEEK

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

1 WEEK

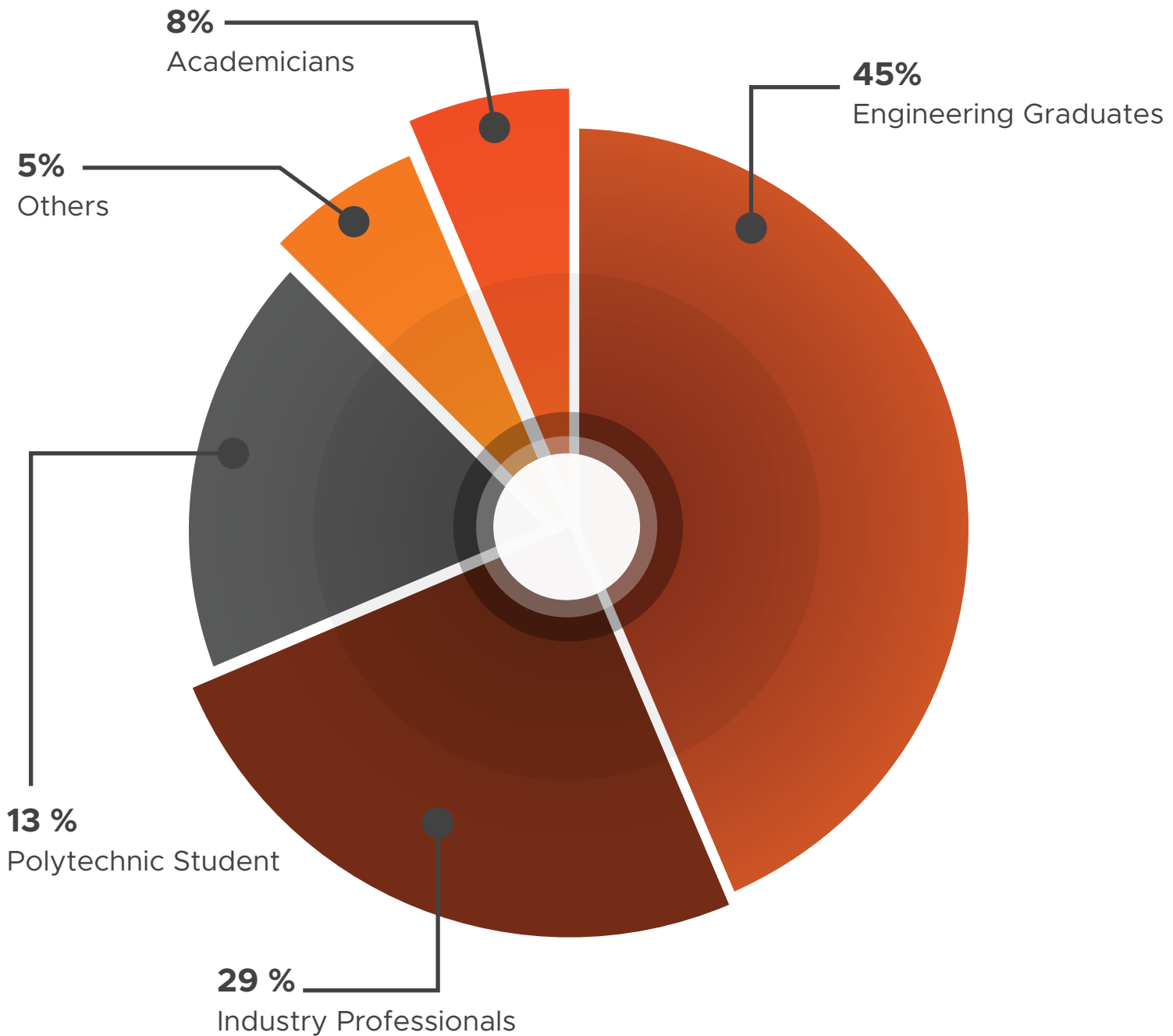
PROJECT 3: VCU AND COMMUNICATION

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.

1 WEEK

Meet the Class

OUR LEARNER'S COMES FROM



Career Support

Interview Preparation

Pre-recorded content on topics such as

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

Industry Readiness Assessments

Industry oriented tests which are pre-prepared and validated by domain experts.

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

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

Profile Builder

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

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

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

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.



Program Details and Admission Process

PROGRAM DURATION AND FORMAT

09 Months | Online | Live

PROGRAM FEES

Starting at INR 4000/month* or INR 72000/-

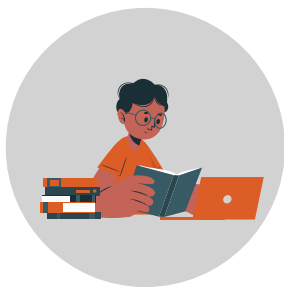
ELIGIBILITY

Bachelor's Degree with 50% or equivalent passing marks.

PROGRAM START DATE

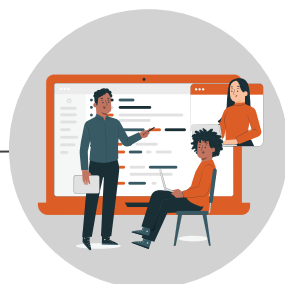
Please refer to the website for program start dates.

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

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