



SKILL  LYNC

POST GRADUATE  
CERTIFICATION PROGRAM IN

# EV & AUTONOMOUS VEHICLE TECHNOLOGY

**12**

MONTHS

**25+**

PROJECTS

**135**

CHALLENGES

**100%**

PLACEMENT ASSIST

**11**

CORE MODULES

Contact: +919342691281

Website: <https://skill-lync.com/>



# About this Certification Program

**19M+**JOBS IN INDIA'S  
AUTO SECTOR**2M+**NEW ENGINEERING  
ROLES BY 2030**12**MONTHS OF  
STRUCTURED  
LEARNING**100%**PLACEMENT  
ASSISTANCE

Offered by **iHUB DivyaSampark, IIT Roorkee** in partnership with **Skill-Lync**, this Post Graduate Certification bridges the widening gap between conventional engineering education and what today's automotive & EV industry actually demands. The curriculum spans foundational through advanced **Electric Vehicle technologies** equipping learners with practical, application-ready capabilities that employers actively seek.



## Comprehensive EV Curriculum

Covers the full spectrum from EV fundamentals to advanced battery systems, power electronics, motor design, and vehicle-level integration.



## Industry-Grade Tool Training

Hands-on proficiency with MATLAB, Simulink, ANSYS Maxwell, GT-SUITE, CATIA V5, and Altium Designer through real engineering workflows.



## IIT Roorkee Certification

Earn a certificate from an Institute of National Importance, adding formal academic weight and credibility to your engineering profile.



## Project-Based Learning

25+ real-world projects and 135 structured challenges aligned with OEM & Tier-1 production, validation, and regulatory workflows.



With India's EV sector accelerating rapidly, employers need engineers who go beyond theory. This program builds **industry-ready competencies** through structured learning, modern tools, and guided problem-solving backed by **iHub Divya Sampark-IIT Roorkee certification** and career support from Skill-Lync.

iHUB DivyaSampark, Official Website: <https://tih.iitr.ac.in/>

# iHUB DivyaSampark, IIT Roorkee Certificate

**Certificate issued in collaboration with iHUB DivyaSampark, IIT Roorkee and Skill-Lync.**

The certification validates that the learner has met defined academic requirements and demonstrated applied competence in EV technologies through evaluated coursework and projects. It enhances the credibility of a candidate's profile for core automotive and Electrical engineering roles.



## What This Certification Represents

- ✓ Academic recognition from an Institute of National Importance
- ✓ Industry-relevant learning evaluated through structured assessment
- ✓ Strong theoretical grounding aligned with institutional standards
- ✓ Enhanced credibility during resume screening and interviews



# Program Highlights



## Career-Oriented Curriculum

Designed for electrical and electronics engineers at different experience levels, aligned with real automotive and EV job roles.



## 12-Month Industry-Focused Program

A structured learning journey mapped to OEM and Tier-1 engineering requirements.



## 25+ Industry-Grade Projects

Build hands-on expertise with real-world EV automotive design and development projects.



## 135 Practical Challenges

Strengthen applied skills through structured challenges covering core EV automotive concepts.



## EV Engineering Tool Proficiency

MATLAB, Simulink, ANSYS, GT-SUITE, CATIA V5 across electric powertrain, battery systems, and vehicle integration.



## Career Readiness & Interview Support

Career counselling, mock interviews, and interview opportunities provided by Skill-Lync.



## Learn from IIT Faculty & Industry Experts

Sessions by IIT faculty and experienced industry professionals, with live and recorded learning.

 **MATLAB**

 **Simulink**

 **ANSYS Maxwell**

 **GT-SUITE**

 **CATIA V5**

 **Altium Designer**

# Who This Program Is Designed For

The electric vehicle ecosystem spans multiple domains – including energy storage, power electronics, electric machines, control systems, and vehicle-level integration. This Post Graduate Certification Program in EV & Autonomous Vehicle Technology is structured to support engineers at different career stages who aim to build or advance careers in the EV and electrified mobility domain.

## Who Can Benefit From This Program

### Electrical & Electronics Engineering Graduates / Freshers

Ideal for graduates looking to enter the EV domain with a strong foundation in EV fundamentals, MATLAB & Simulink, batteries, motors, and power electronics, supported by hands-on design and simulation exposure.



### Early-Career Engineers (0–2 Years Experience)

Suitable for engineers from automotive, electrical, electronics, or manufacturing backgrounds who want to transition into EV-focused roles involving battery systems, electric motors, power converters, or EV simulations.



### Working Professionals (2–5 Years Experience)

Designed for professionals seeking structured upskilling in EV system design, energy storage, motor design, power electronics, and model-based development using industry tools such as MATLAB, Simulink, ANSYS, and GT-SUITE.



### Professionals Aiming for EV System & Integration Roles

Relevant for engineers aspiring to work on EV powertrains, battery packs, hybrid systems, wiring harnesses, and system-level simulations, aligned with OEM and Tier-1 EV development practices.



# Course Curriculum

## 1. EV Fundamental

This module introduces the core concepts of electric vehicles, focusing on EV architecture, major subsystems, and operating principles. It builds a strong conceptual foundation for understanding how electric vehicles function as integrated systems.

### Key Topics Covered:

- Electric vehicle architecture and layouts
- Overview of EV powertrain systems
- Key EV components and their functions
- Working principles of electric vehicles

## 2. Matlab and Simulink Basic

This module introduces the fundamentals of MATLAB and Simulink used for engineering computation and system modeling. Learners develop essential skills required for simulation-based analysis in EV and electrical engineering applications.

### Key Topics Covered:

- MATLAB programming fundamentals
- Introduction to system-level simulations
- Data visualization and mathematical modeling
- Simulink block-based modeling concepts

## 3. Design Concepts of Power Electronic Converters for Industries

This module focuses on the design principles of power electronic converters used in industrial and EV applications. Learners understand how converter design impacts efficiency, performance, and reliability.

### Key Topics Covered:

- Basics of power electronics and converters
- Design concepts of industrial power converters
- Application of converters in EV systems
- Efficiency and performance considerations

## 4. Fuel Cell and Ultra Capacitor for EV using MATLAB & Simulink

This module introduces fuel cells and ultra-capacitors as alternative energy sources for electric vehicles. Learners simulate their integration and performance within EV systems using MATLAB and Simulink.

### Key Topics Covered:

- Fundamentals of fuel cells and ultra-capacitors
- Energy storage characteristics and comparison
- EV system integration concepts

# Course Curriculum

## 5. Li-ion Battery System Design in EV & ES

This module covers the design and integration of lithium-ion battery systems for electric vehicles and energy storage applications. Learners understand performance, safety, and efficiency considerations in battery system design.

### Key Topics Covered:

- Li-ion battery fundamentals and chemistry
- Battery pack design and integration
- Performance and efficiency evaluation
- Safety and thermal considerations

## 6. PCB Design for Beginners using Altium Designer

This module introduces printed circuit board (PCB) design fundamentals with a focus on EV-related electronic applications. Learners gain hands-on exposure to schematic creation and PCB layout using Altium Designer.

### Key Topics Covered:

- PCB design fundamentals and workflow
- Introduction to Altium Designer tools
- Schematic capture basics
- PCB layout and component placement

## 7. Electric Motor Design using MATLAB and ANSYS Maxwell

This module focuses on the design and analysis of electric motors used in electric vehicles. Learners perform motor modeling, selection, and performance evaluation using industry-standard tools.

### Key Topics Covered:

- Electric motor fundamentals and types
- Motor design principles for EV applications
- MATLAB-based motor calculations
- Performance analysis using ANSYS Maxwell

## 8. EV Technology Series

This module provides an overview of electric vehicle technologies and their applications within the automotive industry. It helps learners connect individual EV subsystems to the larger vehicle ecosystem.

### Key Topics Covered:

- Overview of EV technologies
- Industry trends in electric mobility
- EV subsystems and integration
- Automotive applications of EV technology

# Course Curriculum

## 9. Basics of Electric Vehicle Simulations using Ansys

This module introduces EV system-level simulation and analysis using Ansys tools. Learners simulate critical EV subsystems to understand performance and thermal behavior.

### Key Topics Covered:

- EV system simulation fundamentals
- Ansys-based EV simulations
- Battery and powertrain modeling
- Thermal management concepts

## 10. Hybrid Electric Vehicle Simulation Using GT-SUITE

This module focuses on modeling and simulation of hybrid electric vehicles using GT-SUITE. Learners analyze energy flow, powertrain behavior, and system efficiency.

### Key Topics Covered:

- HEV architecture and configurations
- GT-SUITE-based HEV simulations
- Energy management strategies
- Powertrain performance analysis

## 11. Automotive Wiring Harness using CATIA V5

This module covers the complete wiring harness design process used in automotive EV applications. Learners understand routing, packaging, and integration of electrical systems within vehicles.

### Key Topics Covered:

- Vehicle electrical distribution system basics
- CATIA V5 electrical workbench workflow
- Wiring harness routing and layout
- Electrical component integration

**11**

CORE MODULES

**25+**

PROJECTS

**135**

CHALLENGES

**6+**

INDUSTRY TOOLS

## OPTIONAL SELF-PACED TRACK

# Autonomous Vehicle & Advanced Skills

## 1 Core and Advanced Python Programming

Python fundamentals: statements, functions, classes, and objects. File handling and exception handling. Numerical and data analysis using NumPy and Pandas. GUI programming using Tkinter. Database handling using SQLite3.

## 2 Data Structures and Algorithms using Python

Time & space complexity analysis. Arrays, linked lists, stacks, queues. Trees, heaps, tries, and graphs. Sorting, searching, and hashing techniques. Greedy algorithms, divide & conquer. Backtracking and dynamic programming.

## 3 Introduction to ADAS & Vehicle Validation

Evolution and history of ADAS. Core ADAS features: ABS, Cruise Control, ACC, AEB, Lane Keep Assist. ADAS levels, development & validation workflows. Simulation tools including MATLAB, Simulink, QGIS. Sensor fusion for autonomous emergency braking. Python scripting and driving scenario validation.

## 4 Applying CV for Autonomous Vehicles using Python

Image processing and feature extraction. Camera geometry and 3D vision. Object detection, tracking, and segmentation. Deep learning-based vision models. Autonomous vehicle perception use cases.

## 5 Localization, Mapping, and SLAM using Python

Fundamentals of localization, mapping, and SLAM. Probability theory and uncertainty modeling in robotics. Robot behavior algorithms and decision-making logic. Introduction to Robot Operating System (ROS) concepts. Python-based scripting using Jupyter Notebook.

## 6 Path Planning and Trajectory Optimization using C++ and ROS

Configuration space and motion planning fundamentals. Sampling-based and non-holonomic planning methods. Trajectory planning and optimization. Basics of reinforcement learning for planning. Practical implementation using ROS and RViz.

## 7 Autonomous Vehicle Controls using MATLAB and Simulink

Automotive control strategies for ADAS and autonomous systems. Model-based system engineering concepts. Control algorithm development and simulation. Designing and modifying Level-2 autonomous vehicle control models. MATLAB and Simulink workflows used in the automotive industry.

# Hands-On Projects

## 1 Matlab and Simulink Basic

### MATLAB & SIMULINK FUNDAMENTALS PROJECTS

Learners apply fundamental MATLAB programming and Simulink modeling concepts to solve optimization and control problems.

Traveling Salesman Problem

Speed Control of a Direct Current (DC) Motor

## 2 EV Fundamental

### EV SYSTEM MODELING & SIMULATION PROJECTS

Learners design and develop simulation-based EV subsystem models using MATLAB & Simulink.

Design and Develop a PWM Controlled Fan Load with DC Motor

Design and Develop a Simulink Model to Understand Energy Analysis of EVs on Different Driving Cycles

Design and Simulation of Buck Converter for Auxiliary Load in EV

Design and Develop a Model for Lithium-ion Battery Pack Capacity Estimation

Design and analysis of range of the vehicle

## 3 Fuel Cell and Ultra Capacitor for EV using MATLAB & Simulink

### FUEL CELL & ENERGY STORAGE MODELING PROJECTS

Learners develop simulation models to understand fuel cell-based electric vehicles and energy storage integration.

Fuel Cell Electric Vehicle Development

Energy Management Technique

## 4 Design Concepts of Power Electronic Converters for Industries

### POWER ELECTRONICS DESIGN & MODELING PROJECTS

Learners design and analyze key power electronic building blocks used in industrial and EV applications.

Loss Calculation of a DC/DC Converter using MATLAB

Modeling of 3 Phase Inverter for Electric Vehicle Application

## 5 PCB Design for Beginners using Altium Designer

### PCB DESIGN & WORKSPACE DEVELOPMENT PROJECTS

Learners gain hands-on experience in PCB design workflows using Altium ECAD software.

Create a Project Workspace for MIC33030

Create a Project Workspace for Arduino Mini

## 6 Li-ion Battery System Design in EV & ES

### BATTERY MODELING & PACK DESIGN PROJECTS

Learners focus on modeling, analyzing, and designing lithium-ion battery systems for EVs and energy storage applications.

Estimating the Voltage-based SOC of the Battery using 1 RC Model in MATLAB

Project Based on a Real-world Scenario

# Projects (Continued)

## 7 Electric Motor Design using MATLAB and ANSYS Maxwell

### ELECTRIC MOTOR ANALYSIS & SIMULATION PROJECTS

Learners analyze and simulate electric motor behavior with a focus on performance evaluation and electromagnetic analysis.

Startup Behavior Analysis of an Induction Motor

Simulation in ANSYS Maxwell and Report Creation

## 8 EV Technology Series

### APPLIED EV CONCEPTS

A short Project that introduces learners to the fundamental concepts of Electric Vehicle (EV) technologies and their applications in the automotive industry.

## 9 Basics of Electric Vehicle Simulations using Ansys

### EV SYSTEM SIMULATION

A short Project which deals with the basics of electric vehicle simulations that can be performed using the software ANSYS.

## 10 Hybrid Electric Vehicle Simulation Using GT-SUITE

### HYBRID VEHICLE DEVELOPMENT PROJECT

Learners develop and simulate a P4 parallel hybrid electric vehicle architecture focused on real-world drivability and fuel economy.

Development of P4 Parallel Hybrid Vehicle

## 11 Automotive Wiring Harness using CATIA V5

### WIRING HARNESS DESIGN & DOCUMENTATION PROJECTS

Learners design and develop automotive wiring harnesses for both engine and vehicle body applications.

Wiring Harness on Engine

Wiring Harness on Car Body



# What Our Learners Say



*"The structured learning and continuous guidance helped me strengthen my technical skills and prepare confidently for industry roles."*

**Kannaiah Yangala** – Post Graduate Trainee, Tata Technologies



*"The EV Design & Development program gave me hands-on exposure to automotive technologies and the confidence to start my career in core EV roles."*

**Venkata Naga Sandeep Bolisetty** – Associate Engineer, BlueBinaries



*"I'm grateful for the opportunity to start my career at Tata Technologies. Skill-Lync played a key role in enabling this transition by connecting learning with real industry opportunities."*

**Mohammed Maheen** – Graduate Engineer Trainee (ER&D), Tata Technologies



*"Skill-Lync's structured courses and strong career support were instrumental in securing my placement. The certification validated my skills and prepared me for real-world engineering roles."*

**Praveen Kumar** – Engineer, Intelizign Engineering Services Pvt. Ltd.



*"Skill-Lync's comprehensive training and expert guidance helped me build strong industry-relevant skills. The certification played an important role in achieving my placement."*

**Tejavath Vijay** – Electrical & Electronics Engineer, Adrasti Technologies



# Take The Next Step In Your Engineering Career

Join a community of engineers building the future of **Electric Vehicle Design & Development**. Our admissions team is here to guide you in choosing the right pathway aligned with your career goals.

## Admissions Open

**Note:** To ensure high-quality faculty interaction and personalized project mentorship, intake is strictly limited to **50 participants per batch**.

**Call Us:** +91 93426 91281 **Email:** info@skill-lync.com **Visit:** skill-lync.com

## Why Choose This Program?

**Certificate:** Earn a certificate through iHUB DivyaSampark, IIT Roorkee, adding formal academic recognition.

**Hands-on Experience:** Build expertise with 25+ real-world EV automotive design and development projects.

**Career Support:** Structured career counseling, mock interviews, and placement assistance by Skill-Lync.

**Industry Tools:** Gain proficiency in MATLAB, Simulink, ANSYS, GT-SUITE, and CATIA V5.

Follow Us

in LinkedIn

Instagram

YouTube

Facebook

**Industry-Aligned. iHUB DivyaSampark Certified. Career-Focused.**