



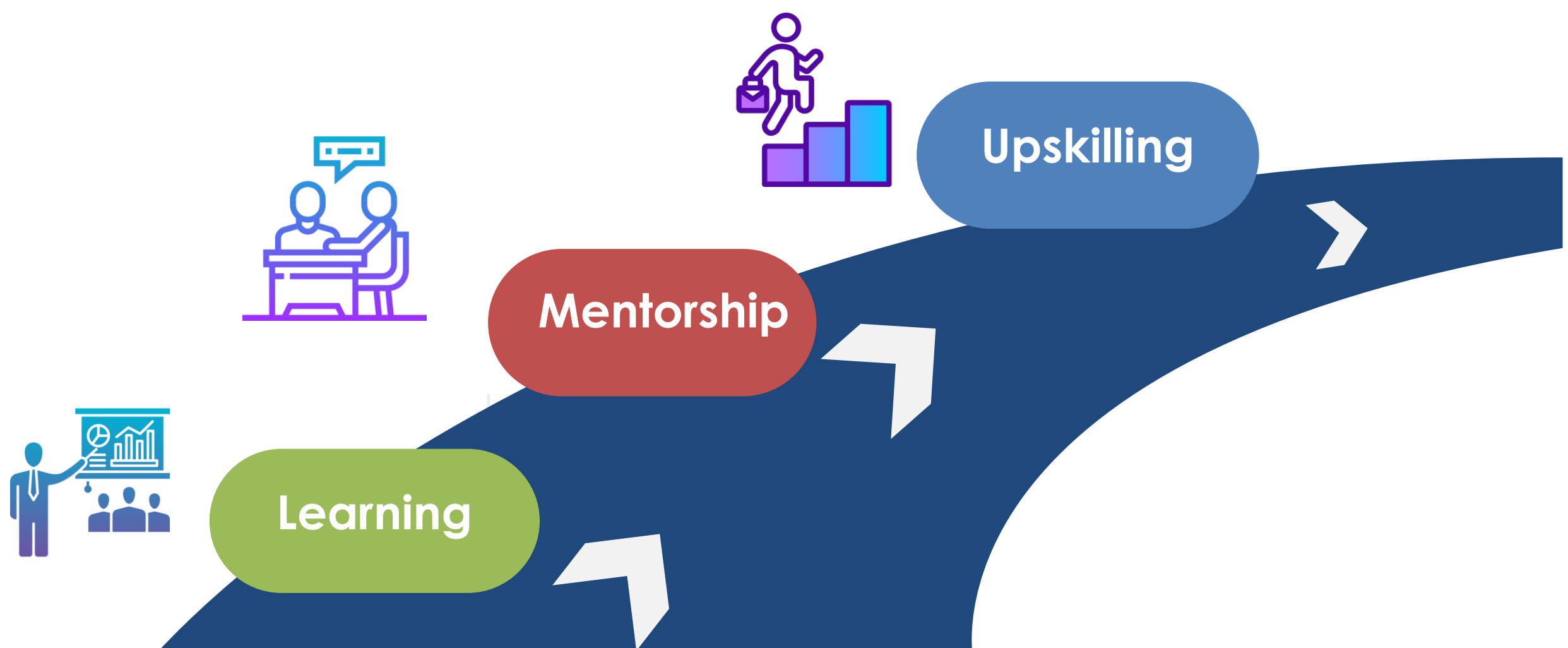
# Electronics & ICT Academy IIT Roorkee



## POST GRADUATE CERTIFICATE PROGRAM IN ELECTRIC VEHICLE (E.V.)

Course offered By- **Electronics & ICT Academy , IIT Roorkee**

Gain a Comprehensive Understanding of the intricacies involved in designing and testing Electric Vehicle to elevate your career to new heights!





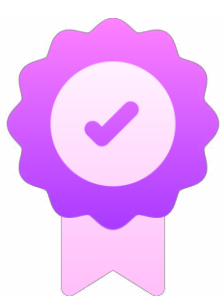


# POST GRADUATE CERTIFICATE PROGRAM IN ELECTRIC VEHICLE



Acquire proficiency in the foundational principles of electric vehicle design and testing through the P.G Certificate Program offered by EICT Academy, IIT Roorkee. Develop a thorough understanding of key concepts, explore relevant case studies, and engage in industry-centric projects to master the domain. Elevate your expertise in electric vehicle technology with this comprehensive program

**The Program is offered by E&ICT Academy Roorkee (IITR)**



**Learn from the Faculty of IIT Roorkee & Industry Experts**



# About Program

The P.G Certification in Electric Vehicle by E&ICT Academy IIT Roorkee is meticulously crafted by the IIT Roorkee faculty members, renowned for their expertise in the field. This program provides comprehensive insights into electric vehicle technology, covering key aspects such as design, integration, and sustainable mobility solutions. Participants will benefit from a curriculum that combines theoretical knowledge with practical applications, ensuring a holistic understanding of electric vehicles. Joining this program promises a transformative learning experience, equipping individuals with the skills needed to thrive in the rapidly evolving electric vehicle industry.

## Key Features

- ✓ 60+ Live Classes
- ✓ Designed for working professionals and freshers
- ✓ Learn from IIT Roorkee faculty & Industry Experts
- ✓ Assignments/quizzes
- ✓ 24\*7 Support by E&ICT
- ✓ Tailored for Working professionals & Fresher's

## Teaching Roadmap

### Quizzes & Assignments

Gain real world projects ideas through hands-on



### Evaluation



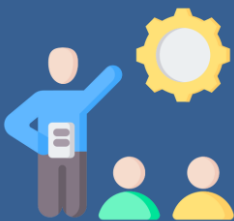
### Assistance

To aid in your learning endeavors



### Guided Classroom Sessions

Get Trained by IIT Faculty & Industry Experts



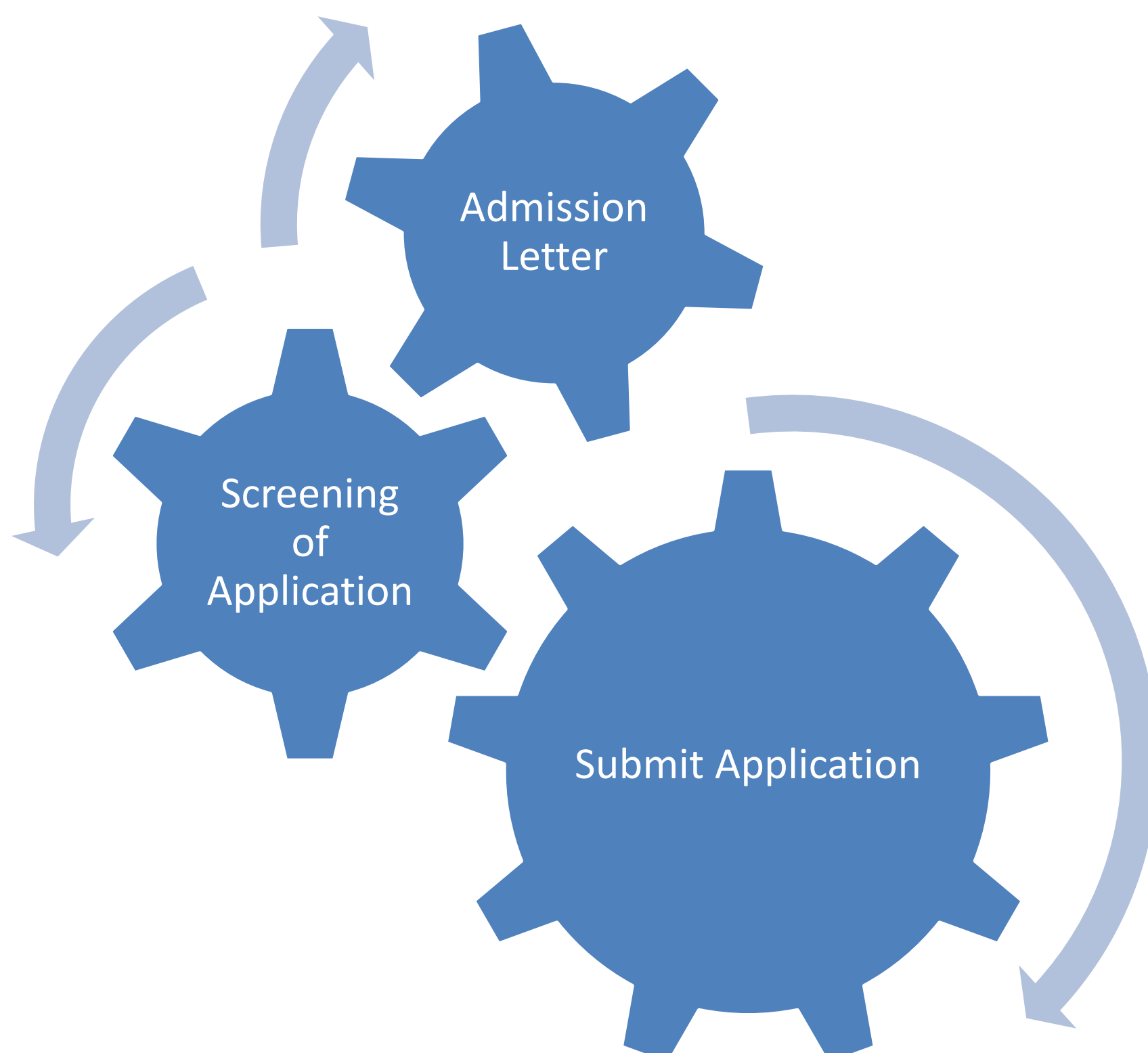


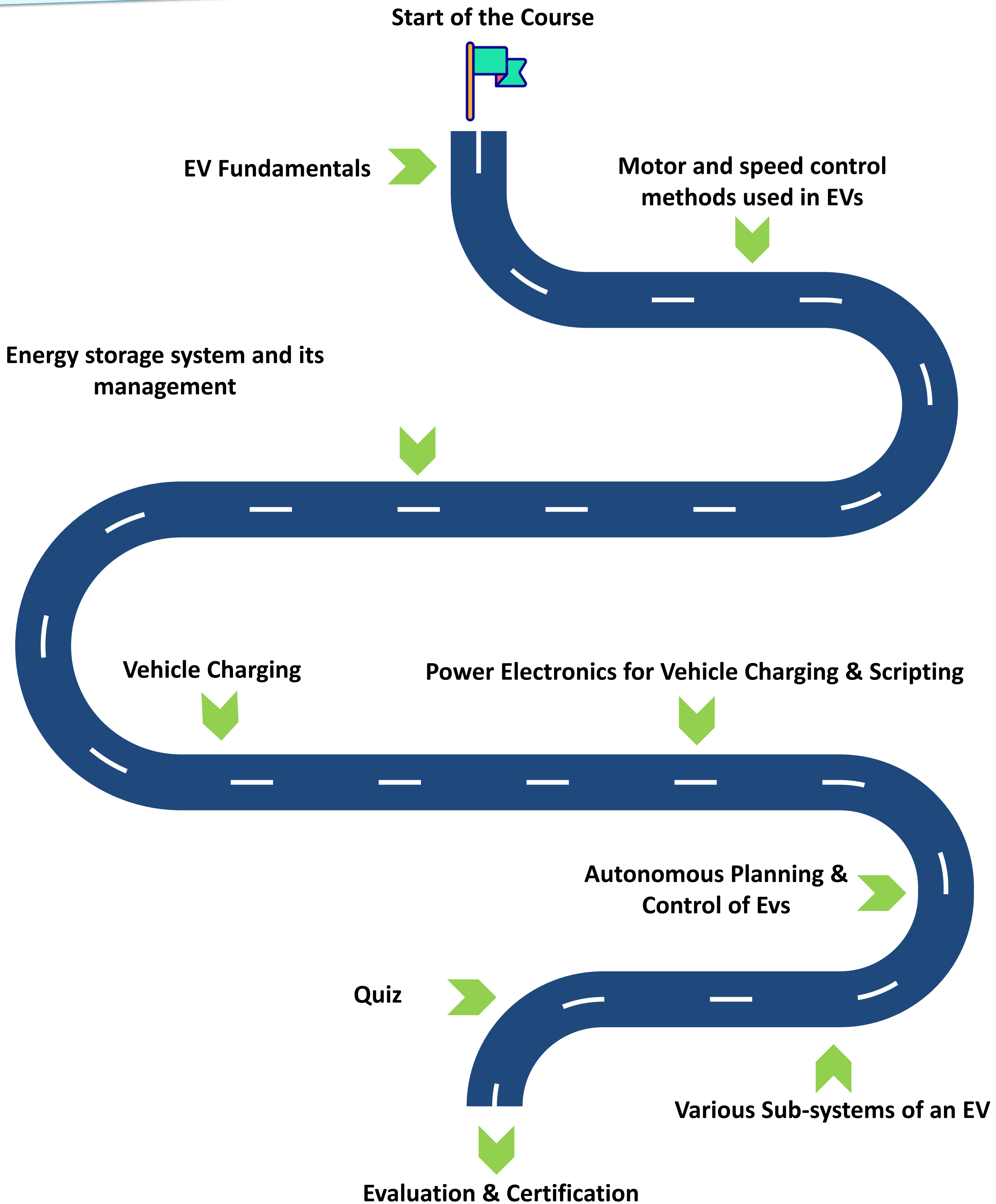
## Who are eligible to enroll in this Program?

- ✓ Novice and recent graduates
- ✓ Mechanical and vehicle engineering professionals
- ✓ Electrical engineering experts
- ✓ Individuals outside the IT sector seeking entry into innovative domains

## Enrollment **Process**

The enrollment process consists of three simple steps. Candidate have to submit their application for enrollment. Selected candidates will receive an admission offer, and upon payment of the program fee, their applications will be confirmed.







## **Module 1: Fundamentals of electric Vehicle**

- Basics of Electro mobility: Pure EV, Hybrid, Plug-In Hybrid, BEV, Hydrogen fueled EV
- EV Advantages & Disadvantages
- Vehicle Specifications



## **Module 2: Motor & Speed Control methods used in EVs**

- EV Motor requirement
- Ratings of motor
- Types of Motors used in EV
- Torque and Speed Controls
- Electric powertrain



## **Module 3: Energy Storage System and its management**

- Energy storage system , Battery modelling
- Characteristics of battery cell and its sizing
- BMS etc.



## **Module 4: Vehicle Charging**

- Battery charging methods
- EV supply equipment ( EVSE), EV battery charger components
- Different types of chargers and its classification
- Standards related to : connectors, communication protocols etc.



## **Module 5: Power Electronics for vehicle charging and scripting**

- Analysis and operation of power converters used in various chargers
- Charging station components
- Renewable integration
- Solid state transformer



## **Module 6: Autonomous Planning and Control of EVs**

- Autonomous Vehicle Kinematics and Constraints
- Control to reference position and pose
- Control of autonomous vehicle
- Lateral Vehicle Dynamics
- Steering Control for Automated Lane Keeping
- Cruise Control in Autonomous Vehicles



## **Module 7: Various Sub-system of an EVs**

- Mechanical subsystems
- Vehicle sensors
- EV testing
- ECUs
- AUTOSAR
- In-vehicle communication



## **Skills to Master**

- Vehicle Fundamentals
- Battery Technology
- Low-Voltage Systems
- Battery Technology
- Charging Infrastructure



**Prof. Mukesh Kr. Pathak**  
**Professor at IIT Roorkee**

Prof. Mukesh K. Pathak is a professor at IIT Roorkee and currently serving as the Head of the Department of Electrical Engineering, IIT Roorkee. A senior member of IEEE, he specializes in power electronics, electric vehicles, solar PV systems, etc.



**Dr. Apurv Kumar Yadav**  
**Assistant Professor at IIT Roorkee**

Prof. Apurv Yadav is presently working as an Assistant Professor at IIT Roorkee. He did his PhD from IISc Bangalore. His research interest includes the power converters for electric vehicles, induction motor drives, etc.



**Prof. Sanjeev Manhas**  
**Professor-ECE Department, IIT Roorkee**

Prof. Sanjeev Manhas is a professor in the ECE dept. of IIT Roorkee and has been associated with it since 2008. His areas of research interest include machine learning and in-memory computing semiconductor memories, IoT, sensors and more.





**Prof. Siba Kumar Patro**  
**Assistant Professor at IIT Roorkee**

Dr. Siba Patro is an assistant professor of IIT Roorkee and did his Ph.D. from IIT Bombay. His interests are power electronic converters, electric vehicle charging stations, Modular multilevel converters, etc.



**Prof. Sohom Chakrabarty**  
**Associate Professor at IIT Roorkee**

Dr. Sohom Chakrabarty is an associate professor at IIT Roorkee and also an IEEE member. He has been awarded for his work in sliding mode control theory, robotics, multi-agent systems and platooning, etc.



**Prof. Ashish Kothyari**  
**Assistant Professor at IIT Roorkee**

Dr. Ashish Kothyari is an assistant professor at IIT Roorkee. He completed his PhD from IIT Bombay in the area of control system and has worked in several renowned institutes and universities in Canada, Germany, and Uk respectively.



**Dr. Mahendra Ghat**  
**R&D Engineer at Siemens**

Dr. Mahendra Ghat is a R&D Engineer at Siemens. He completed his PhD from IIT Bombay in the area of Power Electronics and has worked in various Institutions/Industry.





Curriculum Duration

6 Months



Total Projects

2+



Total Content Hours

65+ Hours



Weekly Time Commitment

4 Hours



Number of Live Sessions

20+



**Hands-on Exercises**

In small groups; case study/literature search

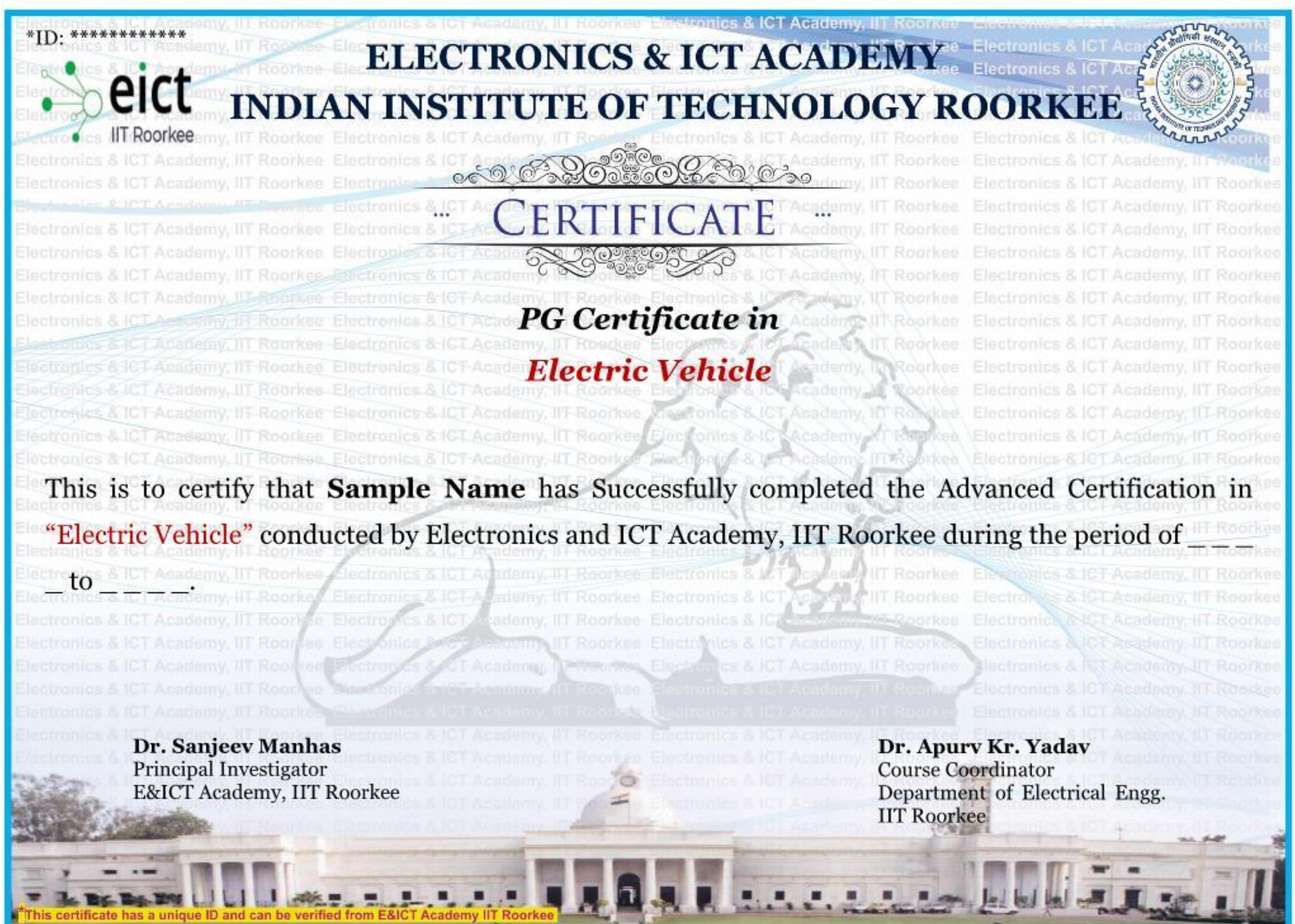




**To receive the prestigious recognition from E&ICT Academy IIT Roorkee:**

- Obtain a minimum of 50% aggregate marks in evaluations.
- Maintain a minimum attendance of 70% in lectures and tutorials.
- Successful completion results in a "Completion Certificate."

**Stay committed to studies for success**







## Who is this Program For?

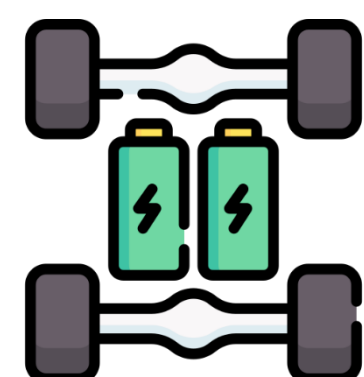
- Anyone having a bachelor's degree and an interest in learning advanced skills in Electric Vehicle
- Professionals who aim to make a career growth in the EV Technology
- Those from the IT field with a bachelor's degree, aiming for a career transition to Electric Vehicle
- Electric vehicle Professionals aiming to upskill themselves in EV Technology
- IT/Comp. Sc. and non-IT professionals to venture into a novel field

## Opportunities **Electric Vehicle Domain**

The electric vehicle (EV) domain presents diverse opportunities. Roles include battery technology development, charging infrastructure expansion, software for EVs, and research in renewable energy to support sustainable transportation. Additionally, there's demand for experts in EV manufacturing, regulatory compliance, and data analytics for optimizing EV performance

**Top tech companies in EV domain are hiring for various roles in EV Technology for certified Professionals in Electric Vehicle Technology**

- **Electric Vehicle Design Engineer**
- **Charging Infrastructure Specialist**
- **Research & Development Engineer of EV**
- **Electric Vehicle Analyst**
- **Battery Technology Engineer**





Curriculum Duration

6 Months



Fees ( inclusive of GST)

Rs. 38,000/-



Fees can be paid in two Installment

1<sup>st</sup> Installment – Rs.19,000/- ( at the time of registration)

2<sup>nd</sup> Installment – Rs.19,000/- ( after 45 days of registration)



Eligibility

Graduates in Engineering (Mechanical, Electrical, Electronics, or Computer Science) or Science, with a keen interest in EV technologies.



Format

Live weekend classes: weekly live interactive lectures from IITR faculty on concept building, hands on exercises and doubt resolution



Refund Policy

Refund can be processed within 2 weeks from the course start date





## E&ICT Academy IIT Roorkee

India is fast emerging as a world power in Information, Communication Technology, and Electronics (ICTE) sector. To complement its growth and further development, there is an ever-increasing need for trained professionals with specialization in this space. This includes training of professionals not only in existing and advanced technologies but also in the fields of electronic manufacturing. To meet this objective MeitY has approved a scheme and set up Electronics and ICT (E&ICT) Academy at IIT Roorkee and other IITs/ NITs.

## Achievements of E&ICT Academy IIT Roorkee

**15,000+****Beneficiaries Trained****25+****Industry Partners****30+****Academic Partners****100+****IIT Roorkee Teaching faculty**

## About **IIT Roorkee**

- Oldest technical institution in Asia, established in 1847
- Offers Bachelors Degree in 11 and Postgraduate Degrees in 55 disciplines
- 22 departments with well equipped lab infrastructure and a central library
- Every year students from more than 50 countries join IIT Roorkee for full-time or short-term training courses



# Contact Us



## Address

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