

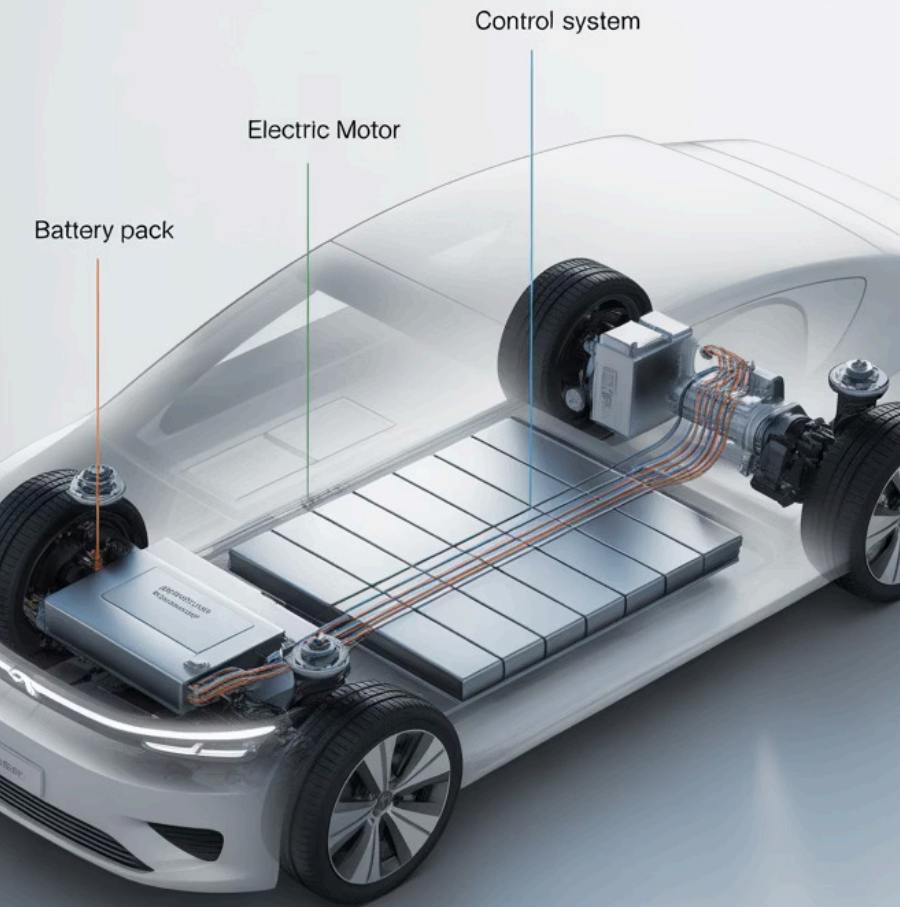


Electric Vehicle Engineering

Welcome to the comprehensive Electric Vehicle Engineering track. This 225-hour program is designed to equip you with the specialised knowledge and skills needed to excel in the rapidly growing electric vehicle industry.

The curriculum spans five key areas of EV technology, from foundational concepts to advanced troubleshooting techniques.

Introduction to Electric Vehicles



Comprehensive Foundation

Gain a thorough understanding of EV fundamentals, electrical concepts, and powertrain architecture essential for building your expertise.



Technology Focus

Explore battery technology, electric motors, controllers, and power electronics that form the core of modern electric vehicles.

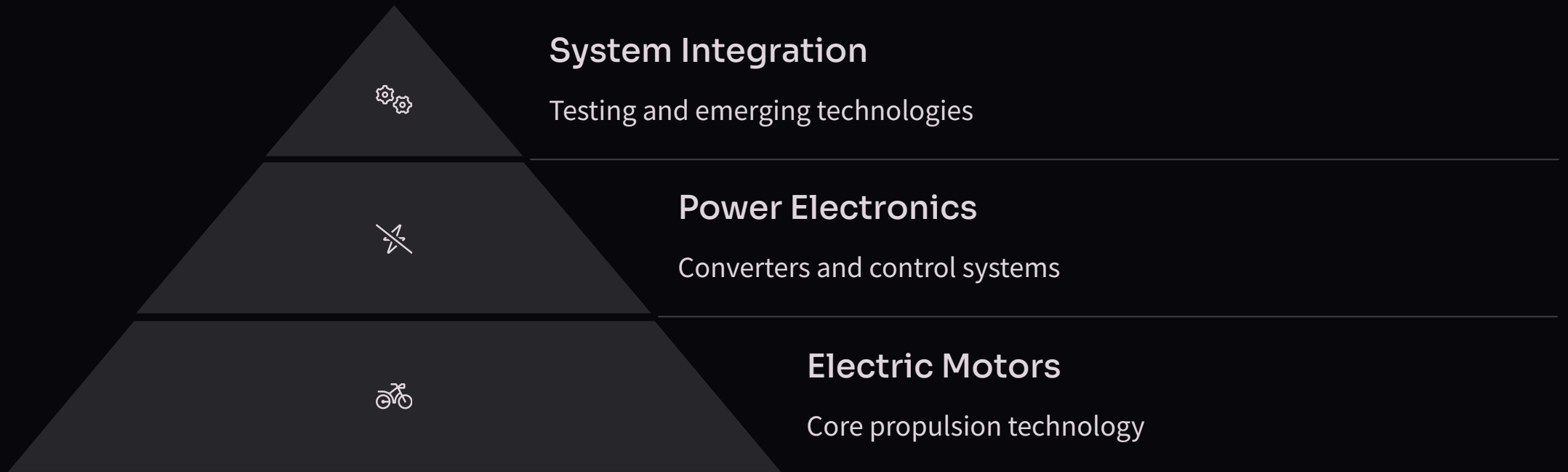


Infrastructure Knowledge

Learn about charging systems, safety standards, environmental impacts, and emerging trends shaping the future of electric mobility.

This foundational module provides the essential knowledge base for all EV professionals. The certification is recognized by Mahindra Electric and the Mahindra Group, opening doors to positions such as EV Technician, Service Engineer, Maintenance Specialist, and Systems Trainer.

EV Powertrain and Components



The EV Powertrain module delves into the heart of electric vehicles, covering electric motors, control systems, power electronics, and drivetrain components. You'll gain expertise in regenerative braking systems and vehicle dynamics simulation.

This specialized knowledge prepares you for roles such as EV Powertrain Engineer, Battery Systems Engineer, Component Specialist, and Powertrain Testing Engineer in the growing sustainable mobility sector.

Battery Management Systems (BMS)



Battery Management Systems are critical for EV performance, safety, and longevity. This module covers battery technologies, BMS fundamentals, state estimation algorithms, and cell balancing techniques that ensure optimal battery operation.

You'll also learn about communication protocols, safety standards, thermal management, and simulation tools. Graduates are prepared for specialized roles as BMS Engineers, Battery Systems Engineers, and Battery Design Engineers.

EV Design and Simulation



Architecture Fundamentals

Establishing the foundational EV design principles and vehicle architecture



Modeling & Simulation

Creating accurate models for vehicle dynamics, powertrain, and battery systems



Energy & Thermal Management

Designing systems to optimize energy usage and thermal performance



Integration & Testing

Bringing components together and validating through case studies and projects

The Design and Simulation module equips you with skills to conceptualize and validate EV systems virtually before physical prototyping. You'll master vehicle dynamics modeling, powertrain simulation, and battery pack design using industry-standard tools.

This knowledge prepares you for roles as an EV Design Engineer, Simulation Engineer, or Systems Engineer, allowing you to contribute to next-generation electric vehicle development.



EV Maintenance and Troubleshooting

Safety & Diagnostics

Learn critical safety practices, regulations, and diagnostic procedures specific to high-voltage EV systems to ensure technician and vehicle safety.

Component Maintenance

Master maintenance techniques for battery systems, electric motors, inverters, and charging systems to keep EVs performing optimally.

Advanced Troubleshooting

Develop expertise in power electronics testing, thermal management, and predictive maintenance strategies through hands-on case studies.

This practical module focuses on the maintenance and repair aspects of electric vehicles. You'll gain hands-on experience with EV systems diagnostics, battery maintenance, motor troubleshooting, and charging system repair.

Graduates are prepared for roles as EV Maintenance Technicians, Troubleshooting Engineers, Service Engineers, and Repair Specialists, meeting the growing demand for qualified EV service professionals.



Career Opportunities for EV Engineers



Automotive OEMs

Work with established manufacturers developing next-generation electric vehicles, contributing to powertrain design, battery integration, and vehicle systems.



EV Startups

Join innovative companies disrupting the transportation sector with new electric mobility solutions, wearing multiple hats across the development process.

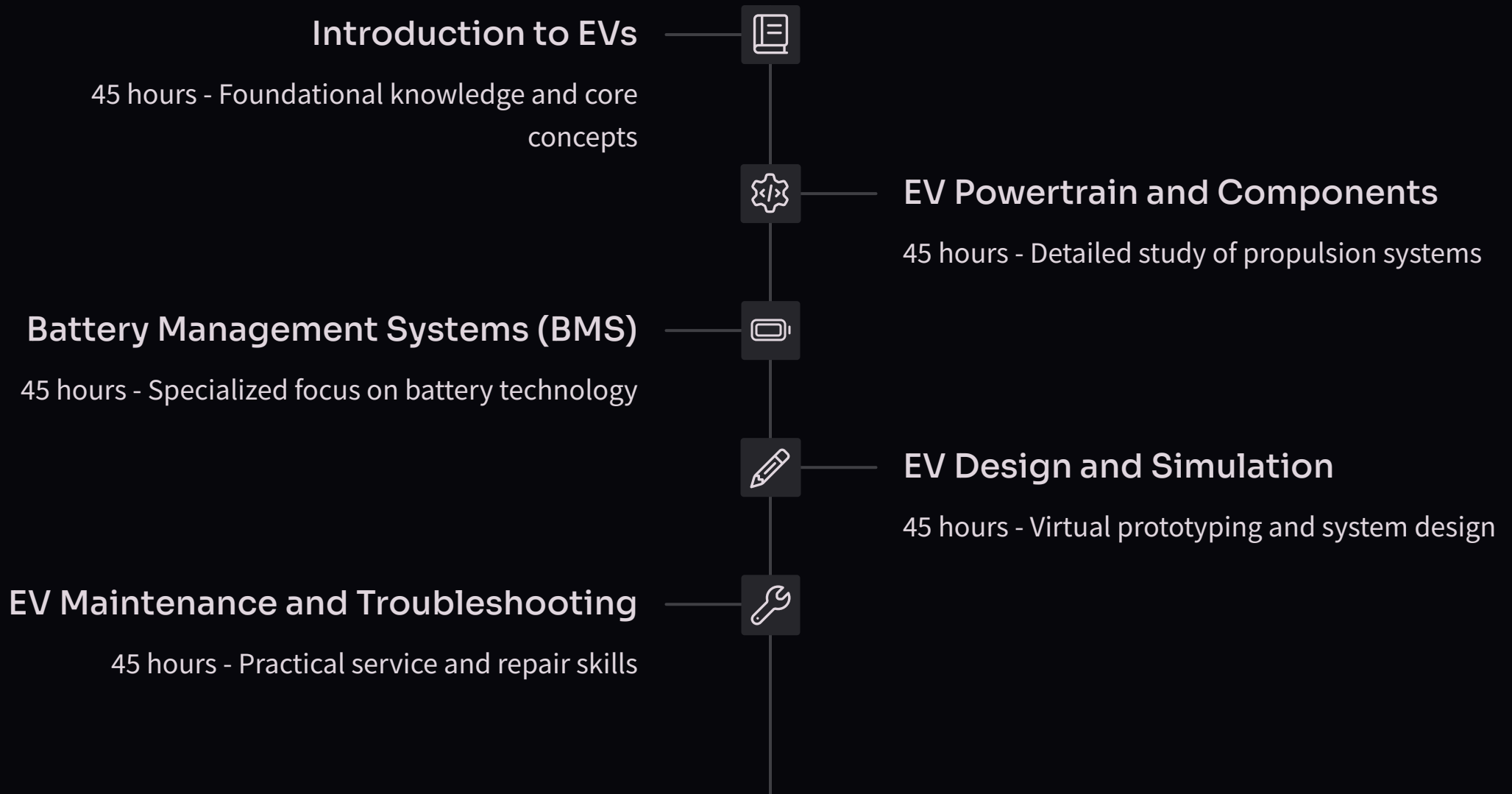


Charging Infrastructure

Design and implement the charging networks essential for widespread EV adoption, focusing on efficiency, reliability, and user experience.

As an EV Engineer/Specialist, you'll find diverse opportunities across the electric mobility ecosystem. The industry is experiencing rapid growth, with positions available at traditional automotive manufacturers, innovative startups, battery technology firms, and infrastructure developers.

Program Structure and Duration



The complete Electric Vehicle Engineering program spans 225 hours of intensive training, divided equally across five specialized modules. Each 45-hour module builds upon previous knowledge, creating a comprehensive educational journey from basic concepts to advanced applications.

The curriculum balances theoretical knowledge with practical skills, ensuring graduates are ready to make immediate contributions in professional settings.

Industry Recognition and Certification



Mahindra & Mahindra Certification

Respected industry credential



Mahindra Electric Recognition

Acknowledged by leading EV manufacturer



Alignment with Industry Needs

Curriculum designed for real-world application

All certifications in this program are provided by Mahindra & Mahindra. The credentials are recognised by Mahindra Electric and the broader Mahindra Group, giving graduates a valuable industry endorsement.

While the certifications have no fixed expiration date, continuous learning is recommended to stay current with rapidly evolving EV technology. The program's curriculum is specifically aligned with the growing electric vehicle and sustainable mobility sectors in India.

Introduction to EVs: Curriculum Deep Dive



EV Fundamentals

Comprehensive overview of electric vehicle technology and principles



Powertrain Architecture

Battery, motor, controller integration layout



Battery Technology

Battery chemistries and management systems



Motor and Controllers

Motor types and control strategies



Charging and Safety

Charging methods and safety standards



Future Sustainability

Environmental, economic impact and future trends

The Introduction to EVs program provides a comprehensive foundation in electric vehicle technology. The curriculum also equips you for the roles of EV Technician, EV Service Engineer, EV Maintenance Specialist, EV Systems Trainer

EV Powertrain: Curriculum Deep Dive

Battery Technologies

Types and performance characteristics

BMS Fundamentals

Battery management system core concepts

State Estimation

State of charge estimation and algorithm methods

Hardware and Balancing

Design and cell balancing techniques

Safety and Thermal

Standards, protection and cooling

Software and Tools

Protocols, simulation, advanced topics

The EV Powertrain module examines the propulsion systems that define electric vehicle performance. You will gain specialized knowledge of various motor types, control strategies, power electronics, and drivetrain configurations that determine how efficiently an EV converts stored energy into motion.

This curriculum prepares you for specialized engineering roles focused on powertrain development, component design, and systems integration in the growing electric mobility sector.

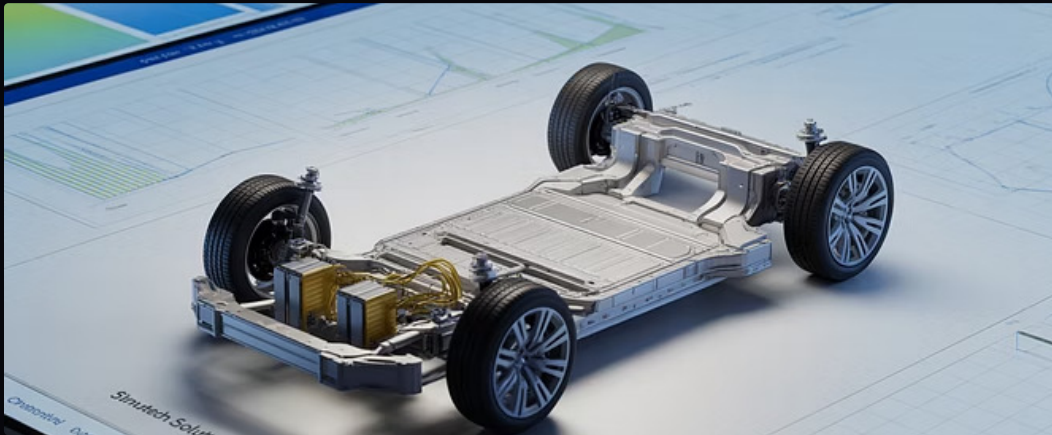
Battery Management Systems: Curriculum Deep Dive

Battery Technologies	Lithium-ion chemistry, cell types, performance characteristics, and future battery technologies
BMS Fundamentals	Core functions including monitoring, protection, data acquisition, and control algorithms
State Estimation	Algorithms for determining state of charge, state of health, and remaining useful life
Cell Balancing	Passive and active balancing techniques to maximize pack performance and lifespan
Thermal Management	Cooling and heating systems to maintain optimal battery temperature ranges

The Battery Management Systems module focuses on the critical technology that ensures safe, efficient, and long-lasting battery operation. You'll learn how BMS monitors cell voltages, manages thermal conditions, estimates battery states, and protects against dangerous operating conditions.

This specialized knowledge is increasingly valuable as battery technology becomes more sophisticated, preparing you for roles specifically focused on energy storage systems for electric vehicles.

EV Design and Simulation: Curriculum Deep Dive



The EV Design and Simulation module teaches virtual prototyping and testing methodologies that are essential for modern vehicle development. You'll learn to model vehicle dynamics, simulate powertrain performance, design battery packs, and optimize energy management systems using industry-standard tools.

The curriculum covers electrical and electronics simulation, system integration approaches, and thermal management modeling. These skills allow engineers to validate designs virtually before physical prototyping, significantly reducing development time and costs while improving final product quality.

Maintenance and Troubleshooting: Curriculum Deep Dive



Safety Protocols

Specialized procedures for working safely with high-voltage EV systems, including proper lockout/tagout techniques, insulated tools usage, and personal protective equipment requirements.



Diagnostic Methods

Systematic approaches to identify and resolve EV-specific issues using specialized diagnostic equipment, manufacturer tools, and troubleshooting flowcharts.



Preventive Maintenance

Scheduled service procedures and predictive techniques to maximize vehicle reliability, performance, and battery longevity through data-driven maintenance planning.

The Maintenance and Troubleshooting module provides practical skills for servicing electric vehicles throughout their lifecycle. You'll learn safety-critical procedures for working with high-voltage systems, diagnostic techniques for complex EV components, and maintenance strategies that maximize vehicle performance and longevity.

This hands-on curriculum includes case studies and practical training that prepare you for technical roles in EV service centers, dealerships, and fleet maintenance operations.



Becoming an EV Engineer/Specialist

225

Training Hours

Comprehensive program duration

5

Specialised Programs

Key knowledge areas covered

100%

Industry Aligned

Curriculum matches sector needs

Upon completing this comprehensive program, you'll emerge as a qualified EV Engineer/Specialist equipped to design, develop, and manage electric vehicle systems across their entire lifecycle—from concept and prototyping to testing and deployment.

Your expertise will span powertrains, battery systems, motor controllers, and charging infrastructure, ensuring you can contribute to performance optimization, safety compliance, and industry standards adherence. This versatile skill set positions you for success in automotive OEMs, EV startups, battery firms, and infrastructure companies driving the electric mobility revolution.