



**INSTITUTE OF THE
MOTOR INDUSTRY**



ELECTRIC VEHICLE E-LEARNING

COURSE OVERVIEW

The Electric Vehicle eLearning package is a multi-module course designed for a wide range of audiences. From individuals wanting basic knowledge of Electric Vehicles, to aspiring Technicians wanting to up skill their ability in repairing electric vehicles. The package is divided into eight modules, each focusing on different elements and learning levels of Electric Vehicle.

ENTRY REQUIREMENTS

There are no formal entry requirement for the eLearning courses, however a basic understanding and experience of motor vehicles would be beneficial for some of the modules.

WHAT YOU CAN ACHIEVE

Once complete you will gain the relevant knowledge to progress on to an IMI Electric and Hybrid Vehicle qualification.

BENEFITS

The Electric Vehicle eLearning will give you:

- IMI CPD hours
- Entitlement to IMI membership and registration (If applicable)

TO FIND OUT MORE GO TO [THEIMI.ORG.UK/ELEARNING/EV](https://www.theimi.org.uk/elearning/ev) OR CALL +44 (0) 1992 511521

ELECTRIC VEHICLES INTRODUCTION

Content includes: Introduction to Electric Vehicles and Hybrids, Different types of Electric Vehicle, Electric market overview, Electric Vehicle history, Electricity cost and emissions, Formula E motorsport and Google Self-Driving cars. (6 hours CPD)

Recommended for: Technicians, Students, Recovery and Emergency Services, Technical Trainers, Assessors and Electric Vehicle owners

SAFE WORKING, TOOLS AND HAZARD MANAGEMENT

Content includes: Introduction to safety, General safety precautions and guidance, Introduction to high-voltages, High-voltage safety precautions, Personal Protective Equipment (PPE), High-energy cables and components, Risks of working with Electric Vehicles, Safe work process, Protection devices, Work categories, Initial hazard assessment, Hazard management, Workshop high-voltage tools and Test equipment. (6 hours CPD)

Recommended for: Technicians, Students, Recovery and Emergency Services, Technical Trainers and Assessors

ELECTRICAL AND ELECTRONIC PRINCIPLES

Content includes: Basic electrical principles, Electron and conventional flow, Effects of current flow, Fundamental quantities, Electrical circuits, Conductors, Insulators and semiconductors, Resistors and circuit networks, Magnetism and electromagnetism, Electromagnetic induction, Mutual induction, Definitions and laws, Electronic components, Components, Integrated circuits (6 hours CPD)

Recommended for: Technicians, Students, Technical Trainers and Assessors

ELECTRIC VEHICLE TECHNOLOGY

Content includes: Introduction to Electric Vehicle technology, Identifying Electric Vehicles, Hybrid and Electric Vehicle layouts, Single and wheel motors, Classifications/operation/configurations of Hybrid with a 48V system, Hybrid control systems, High-voltage cables and components, ECE-R100, Heating and air conditioning (6 hours CPD)

Recommended for: Technicians, Students, Technical Trainers and Assessors

BATTERIES

Content includes: Battery overview, Battery ranges, Battery life and recycling, Types of battery, Lead–acid batteries (Pb–PbO₂), Alkaline (Ni–Cad, Ni–Fe and Ni–MH), Sodium–nickel chloride (Na–NiCl₂), Sodium–sulphur (Na–S), Lithium-ion (Li-ion), Fuel cells, Super-capacitors, Flywheels (6 hours CPD)

Recommended for: Technicians, Students, Technical Trainers and Assessors

MOTORS AND CONTROL SYSTEMS

Content includes: Construction and function of electric motors, Types of motor, AC motors basic principle, Synchronous motors, DC motors, Electronically commutated motor, Switched reluctance motor, Motor efficiency, Control system, Power control, Sensors, Battery (6 hours CPD)

Recommended for: Technicians, Students, Technical Trainers and Assessors

CHARGING

Content includes: Charging standards and infrastructure, Charging time and cost, Charging modes, Charging plugs, Vehicle-to-grid technology, Wireless power transfer, Stationary WPT, Dynamic WPT, Solar charging case study, Overview (6 hours CPD)

Recommended for: Technicians, Students, Technical Trainers and Assessors

MAINTENANCE, REPAIRS AND REPLACEMENT

Content includes: Technical information, De-energizing, Maintenance, Repairs affecting other vehicle systems, Inspect high-voltage components, Remove and replace high-voltage components, Battery pack, Low-voltage components, Re-energising, Records and recommendations, Roadside assistance, Roadside repairs and recovery, Emergency response, Pro-assist hybrid mobile app, General Motors EV, Nissan LEAF 2016, General Motors Volt 2016 (USA version), Two-motor drive unit, Range extender, Tesla Roadster, Motor control, Power control, Honda light Hybrids overview, IMA battery, IMA motor Hybrid, IMA control system, Bosch parallel full-Hybrid, Power boost, Control system, Hybrid and GDI engines, Optimised components, Volkswagen Golf GTE, Motor and power electronics, Internal combustion engine and transmission, Driver's control systems (12 hours CPD)

Recommended for: Technicians, Students, Recovery Services, Technical Trainers and Assessors