

# EV BATTERY SPECIALIST



**Eligibility:** Graduates and final year students from B.E./B.Tech (all streams) | Year of graduation: 2019 - 2026

## MODULES

### 1. Introduction to EV industry

Electricity principles, AC/DC types, conductors, semiconductors, key laws, circuits, electronic components, essential tools, and wiring diagrams with symbols, color codes, and nomenclature.

### 2. Industrial safety guidelines

Safety awareness in industrial settings, identifying workshop hazards, electrical and fire safety, proper use of PPE, personal safety, and risk management tools including LOTO, signboards, safety training, and TBT.

### 3. Basics of electrical & electronics

The journey of EV, current EV landscape, its impacts on environment & the ecosystem of components.

### 4. Energy storage

Introduction to energy, its generation, and conversion. Learn about energy storage systems, including mechanical (spring, flywheel, pneumatic, hydraulic), thermal (PCM), chemical (fuels), electromagnetic (inductor, capacitive), and electrochemical storage.

### 5. Cell introduction

Cell evolution, construction, and chemistry. Study primary (alkaline, zinc-carbon) and secondary cells (NiCd, NiMH, lithium, lead acid). Compare characteristics, market conditions, types, pros/cons, power, capacity, and datasheet reading.

### 6. Cell to module

Electrical interconnections (series/parallel) and module structure. Learn module construction, physical interconnections (busbar, wire bonding, welding), thermal management, OCV, IR impedance tests, and visual checks for quality assurance.

### 7. Module to battery pack

Battery pack design by interconnecting modules to achieve

rated capacity. Individual cell data, housing, IP rating, gasket use, OCV, IR, Cole-Cole plot, visual checks, physical tests, and charging/discharging cycles. Monitor current, voltage, humidity, and temperature.

### 8. BTMS

Thermal management, understanding thermal runaway, and explore various BTMS types including air cooling, liquid cooling, and phase change materials (PCM).

### 9. BMS

Importance and evolution of Battery Management Systems, their applications, components, topologies, sensors, actuators, cell balancing, and key functions such as SOC, SOH, fault diagnostics, and charging control.

### 10. Battery charging

Battery charging principles (constant current, constant voltage), charger types (Level-1, Level-2, DC-Fast), protocols, regenerative braking. Learn discharge principles, methods, profiles, and load management techniques for battery life extension.

### 11. Troubleshooting & diagnosis EV battery pack

HV safety protocols and proper material handling. Maintain room conditions and battery segregation based on SOC and chemistries. Prevent environmental and physical damages. Perform regular maintenance, fault diagnosis, and IC checks.

### 12. Human skills

Interactive workshops, role-playing, and real-world simulations, fostering empathy, communication, adaptability, and leadership for holistic skill development.

Admission Confirmation Fee: ₹ 5,000

**COURSE FEES**

**₹ 30,000**

**DURATION**

**12 WEEKS**

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