

LITHIUM-ION BATTERY TECHNICIAN

Levels 1-5

Learners on this pathway are introduced to lithium-ion battery technology, the nature of electric current as used in manufacturing, sensors used in electrical devices and the test equipment necessary to troubleshoot and repair batteries and electrically-powered equipment. This pathway employs five levels covering 16 areas of expertise through 60 courses. It will take learners 71 hours to complete this pathway.

Level 1 focuses on the fundamentals of the nature and characteristics of electricity, the units that describe current, voltage and resistance and the different types of lithium-ion batteries. Level 2 concerns itself with the nature of alternating and direct current, the calculation and measurement of voltage and resistance and the nature of electrical circuits. Level 3 involves learners with the construction of electrical connections and the use of the necessary hand and power tools for electrical work. Level 4 focuses on the use of electrical testing equipment to analyze circuits and the methods for making electrical connections. Level 5 provides training on electrically-operated automated systems and the use of non-destructive examination techniques to inspect the quality of manufactured electrical products.

Among the objectives for this pathway, learners will be able to:

- understand the applications for lithium-ion batteries
- define direct and alternating current
- understand the role of sensors in automated industrial systems -define the equipment inspection steps you must perform before using an ohmmeter or multimeter
- understand the role and importance of automated processes

Total # of Modules: 60

Total Hours: 71



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Level 1

Lithium-Ion Battery Safety

- 1.1 Lithium-Ion Battery Overview & Safety

Lithium-Ion Battery Manufacturing

- 1.2 Lithium-Ion Pouch Cell Batteries
- 1.3 Lithium-Ion Prismatic Cell Batteries
- 1.4 Lithium-Ion Cylindrical Cell Batteries

Introduction to Electricity

- 1.5 Production of Electricity
- 1.6 Transmission and Distribution of Electricity
- 1.7 Uses of Electricity
- 1.8 Atomic Structure
- 1.9 Electrical Circuits
- 1.10 Electrical Current
- 1.11 Voltage
- 1.12 Electrical Power
- 1.13 Resistance
- 1.14 Ohm's Law
- 1.15 Watt's Law

Level 2

DC Electricity

- 2.1 Direct Current
- 2.2 Batteries
- 2.3 Circuit Analysis

AC Electricity

- 2.4 Electromagnetism
- 2.5 AC Waveform Generation
- 2.6 Electromagnetic Devices
- 2.7 Transformers
- 2.8 Capacitors

Solid State Electricity

- 2.9 Semiconductors
- 2.10 Solid State Devices

Introduction to Wiring

- 2.11 Wires, Connectors, and Circuit Protection
- 2.12 Connecting Transformers

Level 3

Electrical Connectors

- 3.1 Electrical Connectors and Fasteners

Sensor Technology

- 3.2 Introduction to Sensors Technology
- 3.3 Sensor Technology
- 3.4 Proximity Sensors
- 3.5 Position, Speed and Acceleration Sensors
- 3.6 Industrial Process Sensors
- 3.7 Advanced Sensors

Electrical Hand Tools

- 3.8 Hand Tools for Electrical Wiring

Electrical Measurement Conversion

- 3.9 Electrical Measurement and Unit Conversion

Level 4

Electrical Resistance Test Equipment

- 4.1 Resistance Test Equipment
- 4.2 The Fluke® Multimeter
- 4.3 The Biddle® Ohmmeter
- 4.4 The Avtron® Ohmmeter
- 4.5 The Hewlett Packard® Milliohmeter
- 4.6 The BCD M1® Ohmmeter

Crimping Terminals and Splices

- 4.7 Terminals and Splices
- 4.8 Crimping
- 4.9 Crimping a Terminal
- 4.10 Crimping a Pre-insulated Splice

Level 5

Automation

- 5.1 Introduction to Industrial Automation
- 5.2 Automated Process
- 5.3 Automated System
- 5.4 Introduction to Process Controls

Industrial Controls

- 5.5 Contactors
- 5.6 Overcurrent Protection Devices

Non-Destructive Examination

- 5.7 What is NDE?
- 5.8 NDE Methods
- 5.9 Careers in NDE
- 5.10 Introduction to Visual Testing
- 5.11 Light and the Human Eye
- 5.12 Standard Inspection Techniques
- 5.13 Visual Testing Equipment
- 5.14 Manufacturing Produced Discontinuities
- 5.15 Visual Testing of Welds