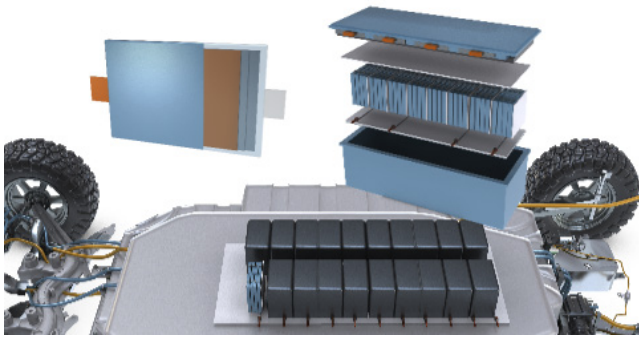


# ELECTRIC VEHICLE BATTERY BASICS

eLearning courses designed to increase productivity and profits

Learning made Simple, Visual, and Interactive



The THORS Electric Vehicle Battery Basics course explores the batteries that are used in electric vehicles to improve range and efficiency. Empower yourself with the understanding of the components that make up a battery and battery-related concepts for electric vehicles. Explore the various types of batteries used in electric vehicles, how each one functions, and where the future trend is heading. This course provides a visually engaging learning experience that is measurable with pre-assessment and post-assessment quizzes.

Credit Hours **2**

## Learning Objectives

- Recall the different components used within a battery pack.
- Understand how the battery cell, battery module, and battery pack function.
- Recognize the electrical concepts related to the battery.
- Differentiate the air-cooled batteries from liquid-cooled batteries.
- Elaborate on each of the battery chemistry classifications.
- Remember the importance of battery safety, including thermal runaway and battery management.
- Interpret and understand the various battery concepts, such as state of health and power density, that influence battery performance.

## Table of Contents

### I. Battery Terminology

- **Battery Components**
  - o Battery Cell
    - Battery Cell Operation
    - Battery Cell Connection
    - Battery Cell Types
  - o Battery Modules
    - Battery Module Foam
    - Interconnection Board
    - Cold Plates
    - Thermal Interface Material
  - o Battery Pack
    - Pack Electronics
    - Pack Electrical Systems
    - Pack Enclosure

### • Battery Concepts

- o Capacity
- o State of Health
- o State of Charge
- o Depth of Discharge
- o Battery Charging
- o Energy Density
- o Power Density
- o Electrical Isolation Methods

### II. Battery Operation and Safety

#### • Battery Operation

- o Classification by Cooling
  - Liquid-Cooled Batteries
  - Air-Cooled Batteries
- o Classification by Chemistry
  - Lead-Acid Batteries
  - Nickel-Metal Hydride Batteries
  - Lithium-Ion Batteries
  - Solid-State Batteries

#### • Battery Safety

- o Lithium-Ion Battery Safety Concerns
- o Thermal Runaway Concerns
- o Battery Management System

