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## Energy Storage Training

Course details: <https://www.electricityforum.com/electrical-training/energy-storage-online-courses>

### COURSE DATES AND TIMES

**March 3-4 , 2022**

10:00 am - 4:30 pm ET

**June 16-17 , 2022**

10:00 am - 4:30 pm ET

**September 12-13 , 2022**

10:00 am - 4:30 pm ET

This 12-Hour, 2-Day Energy Storage Online Course presents students with a broad understanding of electrochemical battery systems and will also cover pumped hydroelectric, compressed air, fuel cells, flow batteries, flywheels, and gravity energy storage systems.

This live online, instructor-led Energy Storage Online Course covers a broad range of

subjects, including: battery storage developments, evolution, applications, and business opportunities. This course will provide students with a comprehensive understanding of the energy storage revolution. Specifically, students will gain insight into the energy storage chain from raw materials to second life and recycling and insights into the latest developments in energy storage technologies.

Emphasis will be on grid-scale (or utility-scale) energy storage as a means of addressing the intermittency of renewable energy components (e.g. solar or wind power systems) of modern T&D grids. Smaller energy storage systems will also be discussed for benchmarking and comparison purposes.

Topics covered include electrical, chemical, thermal, mechanical, electrochemical, thermochemical and thermomechanical energy storage systems as well as grid integration issues.

### **Importance of Energy Storage**

There is a global imperative to integrate electric utility grids and renewable energy supply. Driving innovation is energy storage technologies that have the potential to revolutionize the way energy is stored.

Energy Storage Systems modernize the T&D grid by supporting power and energy in several important ways:

- Voltage support
- Frequency regulation
- Reactive power production
- Duplicating spinning reserves
- Decreasing the need for transmission upgrades
- Shifting energy
- Grid smoothing and
- Incorporating renewable assets into a smart grid

Energy Storage Systems will decrease the costs of supplying electricity. As Energy Storage Systems prices drop dramatically, especially with the mass production of lithium batteries in

electric vehicles and ESS, there will be dramatic growth in this industry.

This training course will highlight:

- Energy Storage System Technologies
- Energy Storage System Applications
- Energy Storage Systems and the Utility Grid
- Residential and Commercial Energy Storage Systems
- Utility-Scale Energy Storage Systems

By the end of this training course, the participants will be able to:

- Identify Energy Storage System Types
- Design Energy Storage Systems
- Evaluate Existing and Future Energy Storage System Technologies
- Analyze Energy Storage System Data Financial Programs
- Understand how to Incorporate Energy Storage Systems into Existing Infrastructure

#### **WHO SHOULD ATTEND**

- Energy Service and Electrical Contractors
- Electric Utility T&D Infrastructure Managers
- Electrical Project Managers
- Electrical Engineers working in Industrial, Commercial and Institutional Power Systems

## STUDENTS RECEIVE

### **How you will benefit from this training course:**

- Better understand the interaction between the grid and energy storage systems
- Address energy storage in terms of policies and technologies
- Help customers develop energy storage solutions
- Communicate energy storage concepts within and outside the company
- Avoid expensive mistakes when implementing new technologies
- Correctly specify energy storage components when designing projects

### **What will you learn?**

- Different energy storage alternatives, why energy storage is important for our future, and how it can revolutionise the energy sector
- Which raw materials are needed for lithium-ion batteries, how critical they are, and the role of battery management systems
- Examples of different energy storage systems
- Energy storage applications – industrial products and local energy systems

## COURSE OUTLINE

### **Energy Storage Online Course Program Outline**

#### **DAY ONE**

## **SESSION ONE: OVERVIEW**

- Electrical Energy Storage
- Chemical Energy Storage
- Thermal Energy Storage
- Mechanical Energy Storage
- Electrochemical Energy Storage
- Thermochemical Energy Storage
- Thermomechanical Energy Storage
- Technology Status and Projected Demand and Cost
- Grid Integration

## **SESSION TWO: ENERGY STORAGE SYSTEMS**

- Energy Storage Systems - Facts and Feasibility
- Energy Storage Systems - Background
- Energy Storage Systems - History
- Battery Energy Storage Systems
- Non-battery Energy Storage Systems

## **SESSION THREE: BATTERY ENERGY STORAGE SYSTEMS DETAILED**

- Lithium
- Lead-acid
- Nickel, NiCad and NiMH
- Lithium Detailed
- Chemistry and Physical Properties

## **DAY TWO**

## **SESSION FOUR: BATTERY ENERGY STORAGE SYSTEMS ELECTRICAL DESIGN**

- DC-coupled Systems
- AC-coupled Systems
- Stand-alone Systems
- Grid-connected Systems
- Multimodal Systems: Grid-connected with Battery Backup
- Hybrid Systems: Systems with PV, Wind, Generator, etc.

## **SESSION FIVE: NON-BATTERY ENERGY STORAGE SYSTEMS**

- Pumped Hydroelectric Energy Storage Systems
- Compressed Air Energy Storage Systems
- Flywheel Energy Storage Systems
- Gravity Energy Storage Systems
- Supercapacitor Energy Storage Systems

## **SESSION SIX: ENERGY STORAGE SYSTEM INTEGRATION**

- Grid Integration with Energy Storage Systems
- Frequency and Voltage Regulation with Energy Storage Systems
- Reactive Power with Energy Storage Systems
- Spinning reserves with Energy Storage Systems

## **COURSE SCHEDULE**

**Both Days:**

**Start: 10:00 am Eastern Time**

**Finish: 4:30 pm Eastern Time**

Contact us Today for a FREE quotation to deliver this course at your company's location.

<https://www.electricityforum.com/onsite-training-rfq>