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## Energy Storage Systems Course

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

### COURSE DATES AND TIMES

**September 12-13 , 2022**

10:00 am - 4:30 pm ET

This 12-Hour, 2-Day Energy Storage Systems Course presents students with a broad understanding and focus of electrochemical battery systems and will also cover a high-level description of other storage technologies such as pumped hydroelectric, compressed air, capacitors, flywheels, and gravity energy storage systems.

This live online, instructor-led Energy Storage Systems 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 how to design and procure electrochemical energy storage systems, including the full life cycle process from sourcing to recycling.

Emphasis will be on grid-scale (or utility-scale) battery energy storage as a means of addressing the intermittency of renewable energy components (e.g. solar or wind power systems) and grid stability. Smaller energy storage systems will also be discussed such as residential and C&I energy storage systems.

### **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 and reactive power support
- Frequency regulation
- Spinning and operating reserves
- Decreasing the need for transmission upgrades
- Shifting Energy, Arbitrage and Firm Capacity
- Grid smoothing and Black Start and Backup
- 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:

- Challenges of Grid Stability
- Energy Storage System Technologies
- Energy Storage System Applications
- Energy Storage Systems and the Utility Grid

- Residential, Commercial Microgrids and Utility-Scale Energy Storage Systems
- Energy Storage Projects and Life Cycle
- Economics of Energy Storage
- Business Models for Energy Storage
- Policies and Future Technologies

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

- Identify Energy Storage System Types
- Design and Procure 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 Systems Course Program Outline**

#### **DAY ONE**

##### **SESSION ONE: OVERVIEW**

- Challenges of grid stability (Variable Renewable Energy (VRE) integration, demand changes, disruptions, etc)
- Energy storage system applications (use cases)
- Energy Storage Market overview

## **SESSION TWO: ENERGY STORAGE TECHNOLOGIES**

- Mechanical storage (pumped hydro, compressed air, flywheel and other)
- Electrical storage (capacitor and supercapacitor)
- Electrochemical storage (lithium-ion, lead-acid, zinc-hybrid cathode, sodium-sulphur, redox flow and other)

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

- System topology
- Energy Storage System Components
- Coupling alternatives (standalone or coupled to generation, AC and DC coupling, etc...)
- Characteristics and parameters
- System Sizing
- Fire safety

## **CASE STUDY**

## **DAY TWO**

## **SESSION FOUR: BATTERY ENERGY STORAGE PROJECTS**

- Design
- Procurement
- Construction
- Testing and commissioning
- Operation
- Maintenance

- Decommissioning and recycling

#### **SESSION FIVE: ECONOMICS AND BUSINESS MODELS**

- Economics of energy storage
- Business models for energy storage
- Policies and energy storage future directions

#### **SESSION SIX: OPEN SESSION**

- Session dedicated to individual areas of interest

#### **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>