



Advance Electrical Design & Engineering Institute (AEDEI)

**(ISO 9001:2015 CERTIFIED INSTITUTE) : NEW DELHI
(ONLINE BATTERY ENERGY STORAGE SYSTEM (BESS))**



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About us :

Advance Electrical Design & Engineering Institute (AEDEI) ISO certified 9001:2015 Electrical Design & Engineering training programs for Dedicated to Electrical Engineers. AEDEI is latest venture for providing the quality education in the best possible facilities is a key aim of Skill developments for various verticals in Electrical Engineering design.

Our Mission :

Our Technical Institute offers a full range of training in electrical ,Electronics & communication and mechanical design courses full fill requirement of current industries ,

These courses which encompass all aspects of core electricity from fundamentals to in-depth of design knowledge are based on several value adding pillars.

Our trainers share their know-how and design experience through demonstrations on dedicated equipment on industries. Courses include training dedicated documents and the possibility of follow-up with regular /internship /e-learning modules. Over one to 45 days depending on the topic, trainees get in-depth, hands-on instruction and the opportunity to practice their acquired know-how.

We cover all the range of engineering industries skills disciplines Online and Offline :

- Battery Energy Storage System (BESS)
- Substation Design Training(AIS and GIS)
- Electrical System Design
- Solar Power Plant Design(KW and MW)
- Technical Transformer Design
- Mechanical Electrical and Plumbing (MEP) design
- HVAC Design
- Piping Power Plant Design
- Solar Structure Design Training (MMS Design)
- Electric Vehicle Charging Station Design
- Electrical Testing Engineer
- QA/QC Electrical
- Power System Software
- Hybrid Electric vehicle Design Training
- Railway Traction Design (OHE DESIGN)
- Floating Solar Power Plant Design

Battery Energy Storage System (BESS) :

This introductory course in design fundamentals will guide you through a step-by-step study of Electrical System design. You will consider all phases, from initial site review and selection to Designing Electrical Equipments

Experienced Instructors :

Your instructors, professional engineers with many years of field and design experience, will train you through theory calculation practical, instructor having expertise electrical system design .

Duration : 3 Months

Mode: Regular/online (LIVE Session)

key Features of Battery Energy Storage System Training :

When you complete this course you will be able to:

- Electrical System Analysis
- Battery sizing and selection
- Scheme of BESS
- Engineering drawings
- Selection& sizing of Balance of system for BESS

Study Materials :

You will receive extensive course materials and Standards that will serve as valuable references in your work.

Battery Energy Storage System (BESS) (Syllabus)

Module-1: ELECTRICAL SYSTEM ANALYSIS

- Engineering Planning of storage system
- Identification Type of Load Pattern (Continuous, Intermittent or Backup)
- Identifications of existing electrical network and system information's
- Study of load pattern and load type to be served by BESS
- Calculation of on grid / off grid load.
- Calculation existing demand and future requirement
- System study for BESS.
- Electrical load and energy consumption calculation

Module-2: SCHEME OF BATTERY ENERGY STORAGE SYSTEM

- Solar-plus-storage system architectures
- Advantage and disadvantage of AC Coupling
- Advantage and disadvantage of DCC Coupling
- Selection of AC coupling equipment's
- Selection of DC coupling equipment's
- Comparison between AC coupling and DC coupling

Module-3: BATTERY SIZING AND SELECTION

- Type of battery and its selection (Li-ion, Ni-cd, lead acid etc.)
- Selection of battery cell and types
- Standardized sizes and shapes pertaining to both primary and secondary batteries
- **Selection of Key technical terms:** end of life, Depth of discharge (DOD), State of charge (SoC), Cycling rate (C-rate)
 - Study Battery critical parameters selection (voltage of cell, Specific energy, Charge (C-rate), dis-Charge (C-rate), Cycle life, current density, Thermal runaway and Applications
 - Battery series parallel connection and String size.
 - Battery mounting arrangement and installation methodology.
 - Battery backup hours

Module-4: SELECTION & SIZING OF PCU AND GRID TIED SOLAR INVERTER

- Selection of bi-directional power conditioning unit (PCU)
- Working principle of bi-directional PCU
- Selection & sizing AC rating of PCU.
- Selection & sizing AC rating of grid tied solar inverter.
- Selection critical parameter of inverter and PCU: input AC, AC output
- Energy Management System
- Batteries and battery management systems
- Dc Input, Dc Output, Battery Charger parameters.

Module-5: SELECTION & SIZING OF BALANCE OF SYSTEM FOR BESS

- Selection sizing of inverter duty transformer
- Sizing of BESS container & ventilation arrangement
- Selection of ACDB, DCDB and switchgear selection.
- Selection of DC cable between DC DB to PCU
- Selection AC Cable between ACDB to transformer
- Cable section for PCU and Inverter
- Type of Earthing and calculation
- Section of string inverter or central inverter
- Protection scheme of HT side

Module-6: SELECTION & SIZING OF CABLE DESIGN FOR BESS

- Selection and Sizing of DC cable
- Selection and Sizing of AC cable
- Selection Criteria of DC cables and AC Cables
- Voltage Drop of cable
- Cable Impedances
- Maximum Permissible Voltage Drop as per standard
- Short Circuit Temperature Rise calculation of cable

Module-7: EARTHING DESIGN AND CALCULATION FOR BESS

- Type of Earthing and calculations
- Factors Influencing The Choice Of Earthed And Unearthed Systems
- System Earthing & Equipment Earthing Connections To Earth
- Resistance to Earth and Earth Electrode Current Density at The Surface of an Earth Electrode
- Selection of an Earthing Conductor and Connection of an Electrode

Module-8: SCHEMES OF PROTECTION FOR BESS

- Type of Protection schemes for BESS
- Fault Current / Short circuit current calculation for BESS
- Type of Protection schemes for BESS

Module-9: SWITCHGEAR SELECTION AND SIZING FOR BESS

- Types of Schemes of Switchgear
- Selection and Sizing of Transformers
- Selection sizing of inverter duty transformer

Module-10: Sizing of BESS Container & HVAC System

- Sizing of BESS container & ventilation arrangement

Module-11: ENGINEERING DRAWINGS & LAYOUTS

- Preparation of BESS single line diagram
- Preparation of AC single line diagram
- Preparation of DC single line diagram
- Preparation of BESS container layout & location
- Preparation of Earthing layout
- Preparation of cable layouts

CASE STUDY ON LIVE PROJECT ON BESS SYSTEM

