

AEE – Certified Energy Auditor (CEA) – On Demand Syllabus

Overview

Course Description

The Certified Energy Auditor On-Demand Training Program offers the full-length version of the CEA program (27+ training hours), through pre-recorded sessions from multiple instructors. Participants will also receive an electronic copy of the workbook to prepare for their exam.

Presented in a way that has a “live” feel the instructors teach participants how to prepare for, conduct a site visit, identify EEMs (Energy Efficiency Measures), quantify the impacts (savings), and present the results in a way that will lead to improvements in their client’s buildings. The instructors fill the course with examples and experiences that tie the material to the real world, and make the connections between the information presented and how to effectively use it as a professional. When used as a certification exam preparation tool, the on-demand program prepares participants for the CEA exam.

Who is the CEA On-Demand Program For?

The short answer is anyone that is focused and committed to a self-study learning format. Professionals interested in, or actively undertaking or assessing energy auditing projects will gain the most. But it is also useful for entry-level candidates or individuals that interact with energy professionals during their daily work.

Monthly Live Q&A

While taking the on-demand CEA course you can attend a once-a-month live 1-hour Zoom Q&A session during which one of the instructors will answer questions.

Objectives

What You Will Learn

- Gain the knowledge and confidence it takes to effectively apply state-of-the-art practices of energy auditing to identify Energy Efficiency Measure opportunities, and to assist buildings achieve control over their energy usage, emissions and costs.
- Become familiar with the current industry standards for energy auditing.
- Learn how systems are intended to operate throughout a building, such as HVAC, lighting, motors, boilers, and controls, etc.
- Understand the economic aspects of energy efficiency measures that Energy Auditor’s identify and learn how to present these opportunities in financial terms that will increase the likelihood of projects being approved for implementation.
- Learn to apply techniques to use in the real world that increase your ability to identify many of the opportunities often overlooked by less experience Energy Auditors.
- Learn the craft from instructors with over 35 years each of auditing experience in countless buildings of all types.

AEE – Certified Energy Auditor (CEA) – Virtual Syllabus

Overview

Course Information

May 20-23, 2024

3.2 CEU

Course Description

This training program is designed to provide attendees an in-depth and technical review of energy auditing, including water usage in a facility. Over four days, our professional instructors will guide you through the principles and practices of greatest relevance and practical value.

Who Should Attend

The program is of greatest value to those undertaking or assessing energy auditing projects. Obtaining AEE's CEA® certification provides international credibility among energy management, sustainable and clean energy communities. Attendees of this program have included existing energy professionals, energy engineers, energy managers, facilities managers, and energy consultants.

Schedule

Daily Breaks Days 1 - 4 : AM Break (15 min) | Lunch Break (1 hr) | PM Break (15 min)

Please see the "My Learning Schedule" tab for schedule information.

**Remote exams are scheduled on an individual basis. See Certification Program tab for additional instructions.*

Workbook

Your workbook will be shipped to the address you provide during registration, and will arrive up to 14 days before the class start date.

To review or update your delivery address before registering, please visit your [Profile](#). (Please note that workbooks cannot be delivered to P.O. boxes.)

If you have already registered for this training and need to update your address, send an email to training@aeecenter.org with your revised address details.

Objectives

Section 1: Developing an Energy Audit Strategy and Plan

- Awareness of:
 - Understand the goal of Energy Audits
 - The major steps in the Energy Audit process
 - The different audit levels
- Ability to:
 - Plan for a successful audit
 - Communicate the results of the Energy Audit effectively to the client

Section 2: Energy Use Analysis

- Awareness of:
 - Energy forms and energy unit's conversion
 - Energy rate structure and benchmarking
- Ability to:
 - Analyze energy consumption for a facility
 - Establish an energy balance for a facility
 - Establish a consumption baseline and adjusting the baseline

Section 3: Data Collection and Analysis

- Awareness of:
 - The importance of data in energy auditing process
 - The different techniques to measure and analyze data
- Ability to:
 - Define the necessary information to collect before and during the field visit
 - Analyze the collected data to turn data into information
 - Obtain an understanding of what is really driving energy consumption

Section 4: Economic Analysis

- Awareness of:
 - Methodologies and tools to analyze and decide on investment projects regardless of their nature; notwithstanding, the main focus will be on energy efficiency projects
- Ability to:
 - Understand the need for economic analysis and the importance of life cycle costing to assess an energy efficiency project
 - Identify which cash flows (revenue and costs) should be included in the analysis
 - Apply investment decision rules such as: Simple Payback Period (SPP), Simple Return on Investment (SRI), Net Present Value (NPV), Internal Rate of Return (IRR), and Saving to Investment Ratio (SIR)
 - Use Interest Tables and construct formulas in Excel for various financial calculations
 - Conduct Life Cycle Cost (LCC) and Free Cash Flow (FCF) analysis for energy efficiency projects
 - Perform a what-if analysis to understand the potential impact on the key financial indicators

Section 5: Lighting Systems

- Awareness of:
 - Concepts and characteristics of energy-effective lighting design
- Ability to:
 - Identify typical lighting energy conservation opportunities
 - Demonstrate lighting economics calculations and relationships

Section 6 - HVAC Systems

- Awareness of:
 - Types and functions of HVAC systems and equipment: Chillers, Cooling Towers, Adiabatic Fluid Coolers, Pumps, Water Distribution, Condensing Water, Waterside Economizers, VRF, Split and Unitary, AHUs, Heat pipe, Heat recovery, Fans, In-Room Terminal
 - Vapor Compression Cycle and HVAC efficiencies (COP, EER)
 - Piping arrangements for chilled water and or refrigerant systems
 - Psychrometric processes
 - ASHRAE 62, Outdoor Economizers, Demand Control Ventilation, and Filtration Systems and Standards
- Ability to:
 - Identify energy efficiency measures (EEMs)
 - Evaluate O&M characteristics and opportunities
 - Calculate energy savings
 - Investigate the existing system and determine the opportunities to improve performance

Section 7: Domestic Hot Water and Water Conservation

- Awareness of:
 - Understand how DHW/SHW is produced, distributed and utilized
 - Know the efficiency improvement opportunities available in DHW/SHW systems
- Ability to:
 - Identify potential EEMs
 - Compute impacts of the EEMs

Section 8: Motors, VFDs, and Compressors

- Awareness of:
 - Electrical Fundamentals
 - Types of Motors
 - Energy Savings Measures for Motors
 - What is Power Factor and why does it matter?
 - Value of Variable Speed Drives (VFDs)
 - Types of Air Compressors and Energy Savings Opportunities
- Ability to:
 - Determine the appropriate energy strategy for motors and compressors
 - Calculate energy savings amounts

Section 9: Building Envelope

- Awareness of:
 - Building Envelope terminology
 - Heat transfer mechanisms
 - Sources of heat loss/gain that affect buildings heating and cooling loads
- Ability to:
 - Calculate heat loss/gain through walls

- Find and calculate R and U values
- Calculate seasonal heat loss/gain through a building

Section 10: Building Automation and Energy Management Systems

- Ability to:
 - Distinguish and classify automation and control systems
 - Investigate the systems operation
 - Recommend performance improvements

Section 11: Alternative Generation and Energy Storage

- Awareness of:
 - Understand the various alternative energy generation technologies available for behind-the-meter applications
 - Be knowledgeable with regards to the various methods to store energy, and where an Energy Auditor may suggest such a system
- Ability to:
 - Determine overall opportunity for alternative methods to generation and storage

Section 12: Energy in Transport

- Awareness of:
 - Types of transport
 - Energy consumption, cost and efficiency
 - Improvements in systems
- Ability to:
 - Evaluate transport system performance and efficiency
 - Discuss and recommend a transport energy strategy