



## Certified Energy Auditor Training Program

*Energy Auditors undertake energy efficiency assessments of commercial and industrial facility's energy systems. Their audits cover building occupancy, operations, maintenance, and code compliance. An auditor aims to provide their client with detailed survey results, risk mitigation analysis, implementation plans, and a final investment-grade analysis.*

### About This Program

This training program has been fully revised and updated for 2021. It is designed to provide attendees an in-depth and technical review of energy auditing. Over four days (exam on fifth day), our professional instructors will guide you through the essential steps necessary to evaluate facility energy systems from preliminary surveys through ASHRAE® Level 3 Energy Audits, how to analyze the results and deliver them to your client.

### What You Will Learn

- Pre-audit requirements to ensure accurate data collection, measurement and verification
- What you need to know when conducting audits of building equipment and systems, such as lighting, pumps, motors, drives, HVAC, water systems, transportation, etc.
- The financial and economic aspects of an energy audit and how they can affect the bottom line for an organization.
- How to analyze utilities, and how energy demand, energy rates, energy accounting and performance contracting all affect an energy audit
- How to identify the “low-hanging fruit” that is ripe for energy conservation opportunities

### At-a-Glance

- » This training program prepares attendees to take the Certified Energy Auditor (CEA®) exam.
- » This program is held over five days.
- » You earn 3.2 CEU | 32 PDH | 6.4 AEE Credits for completing this program.

### Key Takeaways

- » Work through practical examples to demonstrate the topics and procedures covered.
- » Review the various areas of the Body of Knowledge associated with AEE's certification exam.
- » Discuss how to apply what you have learned to your business and applications.
- » Leave with a course workbook that will become an invaluable desk reference.

### Registration

Candidates should contact their local AEE approved training provider for information about available training programs, the certification application process, exam registration, and associated fees. To find your local training provider visit

[aeecenter.org/training](http://aeecenter.org/training)

# Certified Energy Auditor

## Training Program

**FULLY REVISED AND UPDATED FOR 2021**

### Who Should Attend

The program is of most significant 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.

### Course Outline

- Developing an Energy Audit Strategy & Plan
- Energy Use Analysis
- Data Collection & Analysis
- Economic Analysis
- Lighting Systems
- HVAC Part 1 – Systems
- HVAC Part 2 – Boilers
- HVAC Part 3 – Ventilation
- Domestic Hot Water & Water Conservation
- Motors, VFDs, & Compressors
- Building Envelope
- Building Automation & Energy Management Systems
- Alternative Generation & Energy Storage
- Energy in Transport

### Our Instructors

Each member of our team of professional instructors provides their own experience and focuses on specific areas essential to energy auditing. Their combined teaching and industry experience allows them to deliver information that is of the most relevance and practical value to attendees.

### Certification Eligibility

The prerequisites to qualify for the certification process take into account the diverse education and experience applicants may have. Each candidate must meet the required criteria at

[aeecenter.org/cea](https://aeecenter.org/cea)

### Global Training Programs

For a complete list of AEE training programs delivered globally visit

[education.aeecenter.org/global](https://education.aeecenter.org/global)

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### Full Agenda

#### Developing an Energy Audit Strategy & Plan

- Energy Audit Goals & Purpose
- Avoiding Common Audit Shortcomings
- Successful Energy Audit Planning (4 Phases)
- QEA Role
- Complete Audit Process
- ASHRAE Audit Levels 1, 2, & 3
- Investment Grade Audits (IGA)
- ISO 50002, ISO 50001
- Communicating Audit Results to Clients
- Audit Project Team
- ASHRAE Standard 211 for Commercial Building Energy Audits
- Industry Specific Energy Requirements (Codes & Regulations)

#### Energy Use Analysis

- Energy & Power
- Energy Units Conversion (Railroad Track Method)
- Point of Use (POU)
- Energy Rate Structure & Benchmarking (EUI, ECI)
- Rate Components
- Deregulated Service Areas
- Energy Cost Savings
- Facility Energy Consumption Analysis (Load Factor)
- Facility Energy Balancing (Top-Down / Bottom-Up) Degree Days (DD)
- Establishing & Adjusting Consumption Baselines
- Regression Analysis

#### Economic Analysis

- Financial Decision Making
- Life Cycle Cost Analysis (LCCA)
- Capital Investment Project Components
- Time Value of Money (TVM)
- CFO Decision Rules (IRR, NPV, SPP, SIR)
- Project Uncertainty Assessment

#### Data Collection & Analysis

- Measurement & Analysis Techniques
- Preparing for Field Visit (Pre-site Data)
  - Preassessment Interview & Preparation Activities
  - PCBEA Forms
  - Data Sources & Audit Level Tools
  - Onsite Data (Field Visit)
  - Operational Characteristics
  - Operating Conditions
  - Key Measurements
  - Instrumentation & Accuracy
  - Onsite Information Collection Summary
  - Safety Considerations
  - Metering & Sub-metering
- Data Analysis (Field Visit Review)
  - Interval Data (Load Profiles)
  - Regression Techniques
  - Whole Building Modeling
  - CUSUM Analysis
  - Energy Simulation (Modeling, Steps, Tools)

#### Lighting Systems

- Energy Effective Lighting Design
- Lighting Survey
- Lighting System Types & Characteristics
- Lighting Maintenance Principles
- Recommendations & Calculations
- Energy Savings Potential
- Delivery Efficiency
- Identifying Energy Conservation Opportunities

#### Motors, VFDs, & Compressors

- Electrical Fundamentals
- Types of Motors & Energy Savings Measures
- Power Factor
- Variable Frequency Drives (VFDs)
- Air Compressors & Energy Savings Opportunities
- Fan Laws & Harmonics
- Energy Savings Calculations



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### Building Envelope

- Key Terminology
- Thermal Weight
- Heat Transfer Mechanisms
- Thermal Resistance
- Heat Loss/Gain Calculations
- Insulation
- Seasonal Energy Loss/Gain
- Energy Savings Opportunities

### HVAC Part 1 – Systems

- HVAC Systems & Equipment Classification
- Energy Efficiency Measures (EEMs)
- Thermal Environmental Conditions (ASHRAE Standard 55, Comfort Zones)
- Heat & Psychrometrics
- Efficiency Calculations & Indices
- Affinity Laws
- Energy Savings Estimates

### HVAC Part 2 – Boilers

- Overview & Boiler Types
- Combustion
- Seasonal vs. Combustion Efficiency
- Pipe Insulation Calculations
- Steam Traps & Leaks
- Boiler Efficiency Optimization Methods

### HVAC Part 3 – Ventilation

- ASHRAE Standard 62
- Outdoor Air Economizers
- Ventilation Rate & IAQ Procedure
- Filtration Systems & Standards
- COVID-19 (Ventilation & Filtration)
- Performance Improvement Opportunities
- Filtration Standards
- Minimum Efficiency Reporting Value (MERV)

### Building Automation & Energy Management Systems

- Controls & Automation
- Building Management Systems (BMS)
- Building Automation Systems (BAS)
- Building Energy Information Systems (EIS)
- Designated Control/Operations Tasks
- Commissioning Recommendations
- Systems Maintenance
- Domestic Hot Water & Water Conservation
- DHW/SHW Generation
- Calculation Concepts
- Water & Sewer Rates
- Water Auditing Steps
- Water Reduction Measures
- Water Management Planning

### Alternative Generation & Energy Storage

- Alternative Energy Generation Technologies
- Wind Turbines & Solar PV Panels
- Biomass, Hydro Power, & Geothermal Power
- Cogeneration (CHP) Opportunities
- Capacity Factor
- Energy Storage Methods

### Energy in Transport

- Transportation Energy Use
- Road, Rail, Ship, & Air Transportation
- Transport System Efficiency
- Transport Energy Strategy
- Pipeline
- Idle Reduction Technologies
- Route Management
- Performance Indicators
- Mechanical Transport Systems

## Preparatory Courses and Certification Examinations for the Certified Energy Auditor

Locations in India (<https://www.aeecenter.org/certifications/certifications/certified-energy-auditor>) Organized by AEE Kolkata Chapter, IISWBM

### REGISTRATION

Updates on Course schedules, eligibility, fees, contact for details and registration information are available at: [www.iiswbm.edu](http://www.iiswbm.edu) and [www.aeecenter.org/internationalcertification/CEA](http://www.aeecenter.org/internationalcertification/CEA). Before submitting fees, you are advised to check your eligibility and availability of seat by submitting the filled-up application form available at following link for enrolment:

<https://forms.gle/bxbJWwNYjJavgmaX7>

### INDICATIVE INFORMATION: DATES, FEES and PROCEDURE

If those who are eligible, in terms of educational qualification, to take the exam but do not meet the experience requirement, on the date of application for CEA, receive a passing score, they can still earn the Energy Auditor In Training (EAIT) certification. Then they have up to six years to gain the number of years of experience needed based on their education level (see eligibility requirements for CEA & EAIT).

Email your queries to [aeecourseswithiiswbm@gmail.com](mailto:aeecourseswithiiswbm@gmail.com) / [kmaaiswbm@gmail.com](mailto:kmaaiswbm@gmail.com) and/or WhatsApp/SMS +91 9433719779/9123395598.

Last date of submission of filled-up application form along with fees	August 8, 2024
Confirmation of Registration for CEA Training and/or CEA Exam along with invitation for Scheduling CEA exam through ProctorU to Eligible Candidates	September 12, 2024
Conduction of online CEA International training & Practice Session by IISWBM	September 16-20 & 26, 2024
Conduction of online examination by AEE (Through ProctorU)	Sep 27- Oct 15, 2024
Declaration of CEA Examination Result	November 15, 2024

[SI CEA Study Guide available at https://www.aeecenter.org/certifications/resources/cea-resources](https://www.aeecenter.org/certifications/resources/cea-resources)

Many other sources useful to prepare for CEA are also available in the said link. AEE Book also may be available at cost with the AEE Chapter.

Prior to sitting for the exam, each candidate must complete an application.

#CEA Training would be optional for the following candidates:





- Candidate possessing CEA or CEM certification from Bureau of Energy Efficiency (BEE), Government of India
- Candidate completed MBA-PS degree OR Master in Public Systems Management (MPSM) with specialization in Energy Management OR Post-Graduate Diploma in Energy Management (Approved by AICTE) from IISWBM-University of Calcutta.

The CEA exam will be administered during the scheduled Online Exam Window through ProctorU to those, with requisite experience and degree from an (AICTE/UGC/AIU/Such Body) accredited university or college, who has qualified in advance to sit for the exam by submitting a completed CEA application and fee.

Fees for the Training Seminar (in INR)*	50000
Fees for the Examination (in INR)*	40000

\*Add GST 18%. Discount of up to 5% applicable to active AEE members recommended by the applicant's AEE Chapter President/Vice-President

## COURSE INSTRUCTORS FOR CEA INTERNATIONAL

	Dr. Binoy K Choudhury, B.E., CEA & CEM (AEE, USA) Trainer, A.E.A.(BEE, Govt. of India) is Professor in Energy Management, IISWBM and Guest Faculty member at IEST and Kalyani University. Earned experience/training in Germany, Japan, United Nations, Thailand, UK, & USA. About 30 years of experience in Energy Field (academics and industry). Email: <a href="mailto:bkchoudhury@iiswbm.edu">bkchoudhury@iiswbm.edu</a>		Mr. SomDerashri, BE (Chem)-BITS, Pilani & PG in Industrial Engg., CEM & CEA (AEE, USA) Trainer, A.E.A.(BEE, Govt. of India), Certified Lead Auditor for ISO 50001 (BSI, UK), CMVP (AEE & EVO, USA), Over 25 years of industrial experience & completed over 500 Energy Audits in India & Abroad. Launched many innovative energy saving products. Email: <a href="mailto:som_derashri@rediffmail.com">som_derashri@rediffmail.com</a>
	Mr. Vinay Gadikaris an accomplished energy professional working in the field of energy efficiency and renewable energy for more than 15 years. He is CEM & CEA (AEE, USA) Trainer; CEA (BEE, Govt. of India); Lead Auditor for EnMS ISO 50001 (IRCA). He has worked in Process Industries, DCs, Commercial Establishments. Email: <a href="mailto:vinaygenergy@gmail.com">vinaygenergy@gmail.com</a>		Mr. Benet George V is an internationally experienced energy professional and done hundreds of energy audits, related projects and training in 11 countries. His certifications include CEM & CEA (AEE, USA) Trainer, CMVP (AEE & EVO, USA), PMP (PMI, USA), AEA (BEE, Govt. of India), ISO 50001 Lead Auditor and ZED Assessor. Email: <a href="mailto:benet.george@gmail.com">benet.george@gmail.com</a>
For further detail contact <b>Prof (Dr) Krishna M Agrawal, Certification Administrator</b> Email: <a href="mailto:aeecourseswithiiswbm@gmail.com">aeecourseswithiiswbm@gmail.com</a> and <a href="mailto:kmaaiswbm@gmail.com">kmaaiswbm@gmail.com</a> , Mob: 9433719779 <b>Ms Shipra Das, Coordinator</b> , Email: <a href="mailto:shipra@iiswbm.edu">shipra@iiswbm.edu</a> , Mob: 8240143830			
<b>The Director (Acting) of IISWBM &amp; President of AEE Kolkata Chapter : Prof (Dr) Krishna M Agrawal (Email: <a href="mailto:kma_director@iiswbm.edu">kma_director@iiswbm.edu</a>)</b> <b>The Presidents of the supporting AEE Chapters are: Mr Dalip Singh, AEE Delhi Chapter (Email: <a href="mailto:dschahar@gmail.com">dschahar@gmail.com</a>) and Mr Milind Rajendra Chittawar, AEE Western India Chapter (Email: <a href="mailto:milind.chittawar@seetechsolutions.in">milind.chittawar@seetechsolutions.in</a>)</b>			

Submission of Application: For enrolment apply through link <https://forms.gle/bxbJWwNYjJavgmaX7>

OR Emails your credentials to [aeecourseswithiiswbm@gmail.com](mailto:aeecourseswithiiswbm@gmail.com) / [kmaaiswbm@gmail.com](mailto:kmaaiswbm@gmail.com) within stipulated date with Name(s), Qualifications & Experience (enclose supporting document), Address for Communications (with mobile number and Email), and other information as per Application Format with PP size Photo, and proof of online payment made by the stipulated date. Please note the Bank details for NEFT/RTGS Transfer: Beneficiary: IISWBM, Name of Bank: State Bank of India, Surya Sen Street Branch, Kolkata, ACCOUNT NO.: 10252384198, IFS Code: SBIN003496; SWIFT Code: SBININBB492, MICR Code: 700002099 and PAN : AAAT13215M, IISWBM'S GSTIN # 19AAAT13215M2ZJ and accounting head 9992 for 18 % GST.

*Rise to the Top of the Energy Management Profession: Become AEE Certified*