Energy-Efficient Building Design Training Course

Professional Development Training Course Outline

Category	Architectural Engineering	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Energy-efficient building design is a rapidly evolving discipline at the intersection of sustainable architecture, green construction technology, and climate-responsive engineering. Energy-Efficient Building Design Training Course equips participants with advanced knowledge and practical skills to design, analyze, and optimize buildings that minimize energy consumption while maximizing occupant comfort and environmental performance. With rising global demand for net-zero energy buildings, green certification (LEED, BREEAM), carbon-neutral construction, and smart building systems, professionals must adopt innovative design strategies that integrate renewable energy, passive design principles, and high-performance materials.

This course provides a comprehensive deep dive into sustainable architecture, building energy modeling, HVAC optimization, daylight harvesting, thermal insulation systems, and AI-driven energy simulation tools. Participants will explore real-world applications of energy-efficient design in residential, commercial, and industrial projects. By the end of the program, learners will be equipped to deliver high-performance buildings aligned with global sustainability goals, ESG compliance frameworks, and green urban development trends.

Programme Curriculum

Energy-Efficient Building Design Training Course

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Course Duration

5 days

Course Objectives

- Understand principles of energy-efficient and sustainable building design
- Apply passive solar design strategies for optimal energy reduction
- Master building energy simulation and modeling tools
- Analyze thermal comfort and indoor environmental quality (IEQ)
- Design high-performance building envelopes
- Implement renewable energy integration (solar, wind, geothermal)
- Optimize HVAC systems for energy efficiency
- Apply green building certification standards (LEED, BREEAM, EDGE)
- Evaluate carbon footprint reduction strategies in construction
- Utilize smart building automation systems (BMS/IoT)
- Improve daylighting and natural ventilation techniques
- Conduct energy audits and retrofitting assessments
- Develop net-zero energy building (NZEB) design strategies

Target Audience

- Architects and architectural designers
- Civil and structural engineers
- Sustainability and ESG consultants
- Urban planners and smart city developers
- Construction project managers
- Energy auditors and facility managers
- Real estate developers and investors
- Environmental engineering students and researchers

Course Modules

Module 1: Fundamentals of Energy-Efficient Design

- Introduction to sustainable architecture principles
- Energy consumption patterns in buildings
- Climate-responsive design strategies
- Lifecycle assessment of buildings
- Case Study: Passive house model in cold climates reducing heating demand by 80%

Module 2: Building Physics & Thermal Performance

- Heat transfer mechanisms in buildings
- Insulation materials and thermal bridging
- Air leakage control techniques
- Moisture and condensation management
- Case Study: High-performance envelope retrofit in European residential housing

Module 3: Passive Design Strategies

- Orientation and site planning optimization
- Natural ventilation design techniques
- Solar shading and daylight control
- Thermal mass utilization
- Case Study: Tropical school design using passive cooling in Southeast Asia

Module 4: HVAC Systems Optimization

- Energy-efficient HVAC technologies
- Load calculation and system sizing
- Demand-controlled ventilation systems
- Heat recovery ventilation systems
- Case Study: Smart HVAC retrofit in a commercial office reducing energy use by 40%

Module 5: Renewable Energy Integration

- Solar PV and solar thermal systems
- Wind and geothermal applications in buildings
- Net metering and energy storage systems
- Hybrid renewable energy systems
- Case Study: Net-zero residential community powered by rooftop solar grids

Module 6: Building Energy Modeling & Simulation

- Introduction to energy modeling software
- Simulation of energy consumption scenarios
- Parametric design optimization
- AI and machine learning in energy prediction
- Case Study: Digital twin simulation for a high-rise green building project

Module 7: Smart Buildings & Automation Systems

- Building Management Systems (BMS) fundamentals
- IoT sensors for energy monitoring
- AI-driven energy optimization
- Smart lighting and HVAC controls
- Case Study: Smart commercial tower reducing peak energy demand by 35%

Module 8: Green Building Certification & Compliance

- LEED, BREEAM, EDGE certification frameworks
- Carbon accounting and ESG reporting
- Sustainable material selection
- Regulatory compliance and building codes

- Case Study: LEED Platinum certified corporate headquarters achieving net-zero carbon operations

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com