Carbon Capture in 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

Carbon Capture in Building Design Training Course is designed to equip architects, engineers, planners, and construction professionals with advanced knowledge of carbon sequestration technologies, net-zero building strategies, and climate-positive architecture. As global regulations tighten around carbon emissions reduction, ESG compliance, and green building certification (LEED, BREEAM, EDGE), the built environment is undergoing a radical transformation toward low-carbon, carbon-neutral, and carbon-negative infrastructure systems. This training provides a comprehensive pathway to understanding how buildings can actively capture, store, and reduce atmospheric carbon through innovative materials, design integration, and smart energy systems.

This course focuses on the integration of carbon capture technologies (CCUS), bio-based construction materials, urban carbon sinks, and regenerative design principles into modern building systems. Participants will explore real-world applications of climate-resilient architecture, sustainable urban development, and green infrastructure planning, ensuring alignment with global climate goals such as the Paris Agreement and Net Zero 2050 targets. The program bridges theory and practice, enabling professionals to design buildings that not only minimize emissions but actively contribute to carbon removal, environmental restoration, and sustainable urban ecosystems.

Programme Curriculum

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Course Duration

5 days

Course Objectives

1. Understand fundamentals of carbon capture, utilization, and storage (CCUS) in construction
2. Apply net-zero energy building design principles
3. Integrate carbon-negative building materials into architecture
4. Evaluate life cycle carbon assessment (LCA) in construction projects
5. Design using green building certification frameworks (LEED, EDGE, BREEAM)
6. Implement bio-based and regenerative construction technologies
7. Analyze embodied carbon in building materials
8. Develop sustainable urban carbon sink strategies
9. Apply AI and digital twin technology for carbon monitoring
10. Design climate-resilient and adaptive building systems
11. Optimize energy efficiency and renewable integration in buildings
12. Incorporate smart sensors for carbon tracking and emissions control
13. Align building projects with ESG reporting and global decarbonization goals

Target Audience

1. Architects and Urban Designers
2. Civil and Structural Engineers
3. Environmental Consultants
4. Construction Project Managers
5. Sustainability Officers and ESG Analysts
6. Government Urban Planning Officials
7. Real Estate Developers
8. Energy and Climate Change Researchers

Course Modules

Module 1: Fundamentals of Carbon Capture in Built Environment

- Introduction to CCUS in construction
- Global carbon emission challenges in buildings
- Carbon lifecycle in materials and structures

- Role of architecture in climate change mitigation
- Regulatory frameworks and sustainability standards
- **Case Study:** High-performance low-carbon office building retrofit in Europe

Module 2: Net-Zero and Carbon-Neutral Building Design

- Net-zero energy vs net-zero carbon concepts
- Passive design strategies
- Renewable energy integration (solar, wind, geothermal)
- Energy modeling and simulation tools
- Carbon offset strategies in building projects
- **Case Study:** Net-zero residential community in Scandinavia

Module 3: Carbon Capture Materials and Green Construction

- Bio-concrete and carbon-absorbing cement
- Timber and engineered wood systems
- Recycled and circular economy materials
- Algae-based and bio-reactive building skins
- Carbon-storing façade technologies
- **Case Study:** Carbon-negative commercial tower using bio-materials

Module 4: Life Cycle Assessment (LCA) and Embodied Carbon

- Understanding embodied vs operational carbon
- LCA methodologies in construction
- Software tools for carbon analysis
- Material selection for low-carbon buildings
- Reporting and compliance frameworks
- **Case Study:** Embodied carbon reduction in urban hospital construction

Module 5: Smart Buildings and Digital Carbon Monitoring

- IoT sensors for emissions tracking
- AI-driven energy optimization systems
- Digital twin simulation for carbon forecasting
- Smart grids and building automation
- Predictive maintenance for sustainability
- **Case Study:** AI-enabled smart campus reducing 40% carbon emissions

Module 6: Urban Carbon Sinks and Landscape Integration

- Green roofs and vertical forests
- Urban forestry and carbon sequestration
- Wetlands and blue-green infrastructure
- Biodiversity integration in cities
- Climate-positive urban planning
- **Case Study:** Vertical forest residential towers in Milan

Module 7: Policy, ESG, and Green Certification Systems

- Global carbon regulations and policies

- ESG frameworks for real estate development
- LEED, EDGE, BREEAM certification process
- Carbon credit markets and trading
- Corporate sustainability reporting
- **Case Study:** ESG-compliant smart city development in Asia

Module 8: Future of Regenerative and Climate-Positive Architecture

- Carbon-negative building innovations
- AI and generative design in sustainability
- Climate-adaptive infrastructure systems
- Circular economy in construction
- Future trends in regenerative cities
- **Case Study:** Experimental carbon-absorbing prototype city district

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
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:

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