Bio-Based Building Materials 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

The construction industry is undergoing a transformative shift toward sustainable construction, circular economy solutions, and low-carbon building technologies. Bio-based building materials are emerging as a key driver in reducing the environmental footprint of the built environment while enhancing performance, durability, and energy efficiency. Materials such as hempcrete, bamboo composites, mycelium-based insulation, straw bale systems, cork panels, and timber innovations like CLT (Cross-Laminated Timber) are redefining how modern architecture aligns with net zero carbon goals, climate-resilient infrastructure, and green building certifications (LEED, BREEAM, EDGE).

Bio-Based Building Materials Training Course is designed to equip professionals with advanced knowledge and practical skills in the design, selection, application, and lifecycle assessment of bio-based materials. Participants will explore cutting-edge innovations in biomimicry design, carbon sequestration materials, regenerative construction, eco-friendly building systems, and sustainable urban development. The course integrates real-world case studies, industry best practices, and hands-on methodologies to support the transition toward decarbonized construction ecosystems and climate-smart infrastructure development.

Programme Curriculum

Bio-Based Building Materials Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Understand principles of bio-based construction materials and green building innovation
2. Analyze carbon-neutral building strategies and sustainable material lifecycle
3. Evaluate performance of hempcrete, bamboo, mycelium, and timber engineering systems
4. Apply concepts of circular economy in construction and material reuse
5. Develop skills in eco-design and regenerative architecture principles
6. Assess embodied carbon reduction techniques in building materials
7. Explore biodegradable construction technologies and low-impact materials
8. Implement life cycle assessment (LCA) for sustainable building products
9. Integrate climate-resilient infrastructure design using natural materials
10. Understand green certification systems (LEED, BREEAM, EDGE compliance)
11. Promote zero waste construction and sustainable procurement practices
12. Evaluate innovations in bio-composites and biomaterials engineering
13. Support adoption of net zero energy buildings and decarbonization pathways

Target Audience

1. Architects and Urban Designers
2. Civil and Structural Engineers
3. Construction Project Managers
4. Sustainability and ESG Consultants
5. Environmental Engineers
6. Real Estate Developers
7. Government Housing & Infrastructure Planners
8. Green Building Certification Professionals

Course Modules

Module 1: Introduction to Bio-Based Building Materials

- Evolution of sustainable construction materials
- Classification of bio-based materials
- Natural vs synthetic building materials comparison
- Role in climate change mitigation
- Global green building trends

- **Case Study:** Passive housing projects using hempcrete in Europe reducing energy demand by over 60%

Module 2: Hempcrete & Hemp-Based Construction Systems

- Hemp-lime composite properties
- Thermal insulation performance
- Carbon sequestration capability
- Structural applications in housing
- Cost-benefit analysis
- **Case Study:** Hempcrete residential eco-villages in France achieving net-zero operational emissions

Module 3: Bamboo Engineering & Structural Applications

- Bamboo tensile strength characteristics
- Engineered bamboo laminates
- Earthquake-resistant bamboo structures
- Treatment and durability enhancement
- Sustainable sourcing practices
- **Case Study:** Bamboo high-rise prototype buildings in Asia demonstrating seismic resilience

Module 4: Mycelium-Based Construction Materials

- Fungal material growth technology
- Mycelium insulation panels
- Biodegradable packaging in construction
- Fire resistance and acoustic properties
- Circular manufacturing process
- **Case Study:** Mycelium insulation used in experimental eco-buildings in the Netherlands

Module 5: Cross-Laminated Timber (CLT) & Mass Timber Innovation

- Engineered wood technology
- Structural applications in tall buildings
- Carbon storage benefits
- Prefabrication advantages
- Fire safety engineering
- **Case Study:** 18-story CLT building in Norway showcasing low-carbon urban development

Module 6: Straw Bale, Cork & Natural Fiber Systems

- Straw bale thermal performance
- Cork insulation applications
- Flax, jute, and sisal composites
- Moisture resistance strategies
- Rural sustainable housing solutions
- **Case Study:** Straw bale eco-homes in the USA achieving ultra-low energy consumption

Module 7: Life Cycle Assessment (LCA) & Carbon Accounting

- Embodied carbon measurement tools
- Environmental impact assessment

- Material lifecycle tracking
- Sustainable design optimization
- Green procurement strategies
- **Case Study:** LCA-driven material selection in LEED Platinum commercial buildings

Module 8: Smart Integration & Future Green Construction Technologies

- AI in sustainable material selection
- Digital twins for green buildings
- 3D printing with bio-materials
- Smart sensors for energy optimization
- Future trends in regenerative cities
- **Case Study:** 3D-printed bio-based housing prototypes reducing construction waste by 70%

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

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