Construction Materials Technology 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

Construction Materials Technology Training Course is designed to equip learners with advanced knowledge of modern construction materials, sustainable building technologies, material testing methods, and structural performance optimization. This course focuses on the latest trends in green building materials, smart construction technologies, nanomaterials, high-performance concrete, and durable infrastructure solutions, ensuring participants are prepared for evolving demands in the global construction industry.

With rapid advancements in civil engineering materials science, construction innovation, and sustainable infrastructure development, professionals must understand material selection, quality control, lifecycle analysis, and environmental impact. This training delivers practical and theoretical expertise in construction material engineering, durability assessment, material characterization, and eco-friendly building solutions, enabling participants to contribute effectively to modern, resilient, and cost-efficient construction projects.

Programme Curriculum

Construction Materials Technology Training Course

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Course Duration

5 days

Course Objectives

1. Understand fundamentals of construction materials engineering and material science
2. Analyze properties of high-performance concrete and advanced cement composites
3. Apply principles of sustainable and green building materials
4. Evaluate material durability, strength, and lifecycle performance
5. Conduct quality control and material testing procedures
6. Explore innovations in nanotechnology in construction materials
7. Study behavior of steel, polymers, ceramics, and composites
8. Implement smart construction materials and IoT-integrated systems
9. Assess environmental impact using carbon footprint analysis
10. Master construction material standards and compliance regulations
11. Apply techniques in material failure analysis and troubleshooting
12. Optimize cost efficiency through material selection strategies
13. Integrate AI-driven construction material innovation trends

Target Audience

1. Civil Engineers and Construction Engineers
2. Materials Engineers and Technicians
3. Architects and Structural Designers
4. Construction Project Managers
5. Quantity Surveyors and Cost Engineers
6. Infrastructure Development Professionals
7. Engineering Students and Graduates
8. Government and Urban Development Officers

Course Modules

Module 1: Fundamentals of Construction Materials

- Introduction to construction material science
- Classification of engineering materials
- Physical and chemical properties
- Material selection criteria
- Standards and specifications in construction
- **Case Study:** Analysis of material selection in a high-rise building project and its structural performance outcomes.

Module 2: Cement and Concrete Technology

- Types of cement and hydration process
- Concrete mix design principles
- High-strength and high-performance concrete
- Admixtures and additives

- Concrete curing techniques
- **Case Study:** Use of high-performance concrete in bridge construction for durability enhancement.

Module 3: Steel and Metal Applications in Construction

- Properties of structural steel
- Corrosion resistance techniques
- Reinforcement technologies
- Welded and bolted connections
- Advanced metal alloys
- **Case Study:** Structural steel optimization in a commercial skyscraper framework.

Module 4: Sustainable and Green Building Materials

- Eco-friendly construction materials
- Recycled and renewable materials
- Energy-efficient building solutions
- Green certification standards
- Low-carbon construction technologies
- **Case Study:** Implementation of green materials in a LEED-certified residential complex.

Module 5: Advanced Composite Materials

- Fiber-reinforced composites
- Polymer matrix systems
- Hybrid material structures
- Lightweight construction solutions
- Performance enhancement techniques
- **Case Study:** Application of composite materials in aerospace-inspired bridge design.

Module 6: Material Testing and Quality Control

- Non-destructive testing methods
- Compression and tensile strength testing
- Laboratory testing procedures
- Quality assurance frameworks
- Defect identification techniques
- **Case Study:** Quality control failure analysis in a road pavement construction project.

Module 7: Nanotechnology in Construction Materials

- Nano-enhanced concrete materials
- Self-healing concrete technology
- Nano-coatings and surface protection
- Material strength enhancement
- Smart material integration
- **Case Study:** Use of self-healing concrete in tunnel infrastructure development.

Module 8: Smart Construction Materials and Future Trends

- IoT-enabled smart materials
- AI in material performance prediction

- 3D printing in construction materials
- Digital material modeling
- Future innovations in construction technology
- **Case Study:** Deployment of 3D-printed building components in modular housing projects.

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

21 Sep 2026	25 Sep 2026	Online	$1,000
21 Sep 2026	25 Sep 2026	Physical	$1,500
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0

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

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