Modular Structural Systems 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

Modular Structural Systems Training Course is designed to equip engineers, architects, construction professionals, and project managers with advanced expertise in modular construction, prefabricated structural systems, offsite manufacturing, and DfMA (Design for Manufacture and Assembly) principles. As the global construction industry rapidly shifts toward sustainable, cost-efficient, and time-saving building solutions, modular structural engineering has become a core competency for delivering resilient infrastructure and smart buildings. This course bridges theoretical foundations with practical, industry-driven applications in steel, concrete, hybrid modular systems, and digital construction workflows.

With increasing demand for green buildings, smart cities, rapid urbanization, and industrialized construction methods, modular structural systems are redefining how infrastructure is designed and delivered. Participants will gain deep insights into BIM-integrated modular design, structural optimization, seismic-resistant modular frames, and life-cycle performance analysis, enabling them to lead modern construction projects with innovation, precision, and sustainability.

Programme Curriculum

Modular Structural Systems Training Course

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Course Duration

5 days

Course Objectives

1. Master modular structural design principles for modern construction systems
2. Understand DfMA (Design for Manufacture and Assembly) workflows
3. Apply BIM-integrated modular engineering solutions
4. Analyze load distribution in prefabricated structural systems
5. Design steel and concrete modular frameworks
6. Implement offsite construction and assembly optimization techniques
7. Evaluate seismic and wind resistance in modular buildings
8. Integrate sustainable construction and green building standards
9. Optimize construction cost and project timelines using modularization
10. Apply digital twin technology in structural monitoring
11. Improve quality control in prefabrication environments
12. Develop skills in hybrid modular structural systems (steel + RCC)
13. Lead industrialized construction projects using lean methodologies

Target Audience

- Structural Engineers
- Civil Engineers
- Architects & Urban Planners
- Construction Project Managers
- BIM Specialists & Digital Construction Engineers
- Quantity Surveyors
- Infrastructure Developers & Contractors
- Government & Smart City Planners

Course Modules

Module 1: Fundamentals of Modular Structural Systems

- Evolution of modular construction technologies
- Types of modular systems: volumetric, panelized, hybrid
- Structural behavior of modular assemblies
- Material selection in modular design
- Integration of modular systems in modern architecture
- **Case Study:** Analysis of modular housing developments in high-density urban environments demonstrating reduced construction time by 40–60%.

Module 2: DfMA (Design for Manufacture and Assembly)

- Principles of DfMA in structural engineering
- Standardization and repeatability in design
- Manufacturing constraints in structural planning
- Assembly sequencing optimization
- Cost-efficiency through design simplification
- **Case Study:** High-rise modular student accommodation project using DfMA reducing labor dependency and accelerating delivery timelines.

Module 3: BIM for Modular Construction

- BIM-based modular coordination workflows
- Clash detection in prefabricated systems
- 3D/4D/5D BIM integration
- Digital collaboration across stakeholders
- BIM-driven fabrication detailing
- **Case Study:** BIM-coordinated hospital project enabling error-free module installation and improved on-site coordination.

Module 4: Structural Design of Steel Modular Systems

- Steel frame modular configuration
- Connection detailing and joint behavior
- Load transfer mechanisms in steel modules
- Fire and corrosion resistance strategies
- Structural optimization techniques
- **Case Study:** Steel modular bridge project demonstrating rapid installation and high load efficiency.

Module 5: Concrete and Hybrid Modular Systems

- Precast concrete modular components
- Hybrid steel-RCC modular integration
- Structural stability in composite systems
- Vibration and dynamic load considerations
- Durability and lifecycle performance
- **Case Study:** Hybrid modular commercial complex showcasing improved structural rigidity and cost efficiency.

Module 6: Offsite Manufacturing and Assembly

- Factory-based construction workflows
- Quality assurance in prefabrication
- Logistics and transportation of modules
- On-site assembly sequencing
- Productivity optimization strategies
- **Case Study:** Offsite-built residential tower reducing on-site disruption and improving safety performance.

Module 7: Seismic and Wind-Resistant Modular Design

- Seismic behavior of modular joints
- Wind load distribution in modular systems
- Structural damping techniques

- Resilient design strategies
- Compliance with international codes
- **Case Study:** Earthquake-resistant modular school infrastructure designed for high-risk seismic zones.

Module 8: Sustainable and Smart Modular Construction

- Carbon-neutral construction strategies
- Energy-efficient modular systems
- Integration of IoT and smart monitoring
- Lifecycle assessment of modular buildings
- Circular economy in construction
- **Case Study:** Smart modular eco-village project integrating solar energy and digital monitoring systems.

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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