Structural Rehabilitation Techniques Training Course

Professional Development Training Course Outline

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

Course Introduction

Structural Rehabilitation Techniques Training Course is designed to develop advanced knowledge and practical skills in structural assessment, repair engineering, durability enhancement, and sustainable rehabilitation solutions. The course focuses on modern techniques for restoring aging, damaged, and deteriorated structures using advanced construction technologies, structural health monitoring, concrete repair systems, corrosion control methods, strengthening solutions, and performance-based rehabilitation strategies. It enables engineers, consultants, contractors, and asset managers to understand the complete lifecycle of structures and implement effective rehabilitation approaches that improve safety, resilience, service life, and structural performance.

With increasing demand for sustainable infrastructure development, smart construction practices, climate-resilient structures, and cost-effective asset management, structural rehabilitation has become a critical discipline in the construction industry. This training provides practical insights into failure investigation, damage diagnosis, repair material selection, strengthening techniques, and innovative rehabilitation methods through real-world engineering case studies and industry best practices. Participants will gain the expertise required to manage complex rehabilitation projects and deliver reliable solutions for bridges, buildings, industrial facilities, and infrastructure assets.

Programme Curriculum

Structural Rehabilitation Techniques Training Course

Introduction

Structural Rehabilitation Techniques Training Course is designed to develop advanced knowledge and practical skills in structural assessment, repair engineering, durability enhancement, and sustainable rehabilitation solutions. The course focuses on modern techniques for restoring aging, damaged, and deteriorated structures

using advanced construction technologies, structural health monitoring, concrete repair systems, corrosion control methods, strengthening solutions, and performance-based rehabilitation strategies. It enables engineers, consultants, contractors, and asset managers to understand the complete lifecycle of structures and implement effective rehabilitation approaches that improve safety, resilience, service life, and structural performance.

With increasing demand for sustainable infrastructure development, smart construction practices, climate-resilient structures, and cost-effective asset management, structural rehabilitation has become a critical discipline in the construction industry. This training provides practical insights into failure investigation, damage diagnosis, repair material selection, strengthening techniques, and innovative rehabilitation methods through real-world engineering case studies and industry best practices. Participants will gain the expertise required to manage complex rehabilitation projects and deliver reliable solutions for bridges, buildings, industrial facilities, and infrastructure assets.

Course Duration

5 days

Course Objectives

By the end of this training course, participants will be able to:

1. Understand advanced concepts of structural rehabilitation engineering and asset lifecycle management.
2. Apply modern structural condition assessment and diagnostic inspection techniques.
3. Identify causes of structural deterioration including corrosion, cracking, fatigue, and environmental damage.
4. Develop effective repair strategies and rehabilitation planning methodologies.
5. Select suitable advanced repair materials and high-performance construction technologies.
6. Apply concrete rehabilitation methods including injection repair, patch repair, and surface protection systems.
7. Understand structural strengthening techniques using composites, steel systems, and innovative materials.
8. Implement corrosion protection and durability improvement strategies.
9. Analyze structural failures using root cause analysis and forensic engineering approaches.
10. Apply non-destructive testing (NDT) and structural health monitoring technologies.
11. Develop sustainable rehabilitation solutions aligned with green construction and climate resilience goals.
12. Improve decision-making through risk assessment and cost-effective rehabilitation planning.
13. Manage rehabilitation projects using modern quality control, safety, and construction management practices.

Target Audience

1. Civil Engineers and Structural Engineers
2. Construction Managers and Project Engineers
3. Structural Consultants and Design Professionals
4. Building Maintenance and Facility Managers
5. Infrastructure and Bridge Engineers
6. Government and Municipal Engineering Professionals
7. Contractors and Rehabilitation Specialists
8. Researchers, Academics, and Engineering Students

Course Modules

Module 1: Fundamentals of Structural Rehabilitation Engineering

- Principles of **structural rehabilitation and restoration engineering**
- Causes and mechanisms of structural deterioration
- Structural lifecycle management and performance evaluation
- Rehabilitation vs replacement decision-making strategies
- Emerging trends in sustainable infrastructure rehabilitation
- **Case Study:** Rehabilitation planning of aging reinforced concrete buildings affected by long-term deterioration.

Module 2: Structural Inspection, Assessment, and Damage Diagnosis

- Advanced visual inspection techniques and condition surveys
- Structural distress identification and damage classification
- Non-destructive testing (NDT) technologies
- Structural health monitoring (SHM) systems
- Data interpretation and engineering assessment reports
- **Case Study:** Bridge condition assessment using ultrasonic testing and structural monitoring systems.

Module 3: Concrete Repair and Rehabilitation Techniques

- Concrete deterioration mechanisms and repair approaches
- Crack repair methods including injection and sealing systems
- Concrete patch repair and surface restoration techniques
- High-performance repair materials and protective coatings
- Quality control procedures for concrete rehabilitation works
- **Case Study:** Repair of reinforced concrete structures damaged by chloride-induced corrosion.

Module 4: Structural Strengthening and Retrofitting Methods

- Strengthening techniques for beams, columns, slabs, and foundations
- Fiber Reinforced Polymer (FRP) strengthening systems
- Steel plate bonding and external reinforcement methods
- Seismic retrofitting and structural upgrading techniques
- Advanced strengthening solutions for increased load capacity
- **Case Study:** Seismic strengthening of an existing commercial building using composite materials.

Module 5: Corrosion Control and Durability Enhancement

- Mechanisms of reinforcement corrosion
- Cathodic protection and corrosion mitigation systems
- Waterproofing and protective coating technologies
- Durability assessment and service life prediction
- Climate-resistant rehabilitation strategies
- **Case Study:** Marine structure rehabilitation using corrosion protection technologies.

Module 6: Advanced Rehabilitation Materials and Technologies

- Smart materials and innovative repair solutions
- Self-healing concrete technologies

- Ultra-high-performance concrete (UHPC) applications
- Nanotechnology-based construction materials
- Sustainable and low-carbon rehabilitation solutions
- **Case Study:** Application of UHPC for extending the service life of infrastructure components.

Module 7: Structural Failure Investigation and Forensic Engineering

- Structural failure analysis methodologies
- Root cause investigation techniques
- Structural defects and construction-related failures
- Engineering evaluation after structural damage events
- Reporting and recommendations for corrective actions
- **Case Study:** Forensic investigation of structural cracking and rehabilitation planning.

Module 8: Rehabilitation Project Management and Future Trends

- Rehabilitation project planning and execution strategies
- Cost estimation and risk-based decision-making
- Quality assurance and safety management
- Digital technologies including BIM and AI applications
- Future trends in smart and sustainable rehabilitation engineering
- **Case Study:** Digital management of a large-scale infrastructure rehabilitation project.

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:

Register Online Now

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