Seismic Design of Buildings 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

Seismic Design of Buildings Training Course is designed to equip professionals with advanced knowledge of earthquake-resistant design, structural dynamics, seismic analysis, and modern building codes. With increasing global focus on climate-resilient infrastructure, disaster risk reduction, and sustainable construction, this course provides practical skills to design safe, durable, and high-performance buildings capable of resisting seismic forces. Participants will explore performance-based seismic design, advanced structural modeling, earthquake engineering principles, and innovative structural technologies aligned with international standards.

The course integrates theoretical concepts, practical applications, software-based simulations, and real-world case studies to develop expertise in evaluating seismic hazards and implementing effective design strategies. Participants will gain insights into reinforced concrete structures, steel buildings, structural irregularities, seismic retrofitting, resilience engineering, and next-generation building technologies. Through interactive learning, industry examples, and hands-on exercises, professionals will enhance their ability to deliver safe, code-compliant, and earthquake-resilient buildings in challenging environments.

Programme Curriculum

Seismic Design of Buildings Training Course

Introduction

Seismic Design of Buildings Training Course is designed to equip professionals with advanced knowledge of earthquake-resistant design, structural dynamics, seismic analysis, and modern building codes. With increasing global focus on climate-resilient infrastructure, disaster risk reduction, and sustainable construction, this course provides practical skills to design safe, durable, and high-performance buildings capable of resisting seismic forces. Participants will explore performance-based seismic design, advanced structural modeling, earthquake engineering principles, and innovative structural technologies aligned with international standards.

The course integrates theoretical concepts, practical applications, software-based simulations, and real-world case studies to develop expertise in evaluating seismic hazards and implementing effective design strategies. Participants will gain insights into reinforced concrete structures, steel buildings, structural irregularities, seismic retrofitting, resilience engineering, and next-generation building technologies. Through interactive learning, industry examples, and hands-on exercises, professionals will enhance their ability to deliver safe, code-compliant, and earthquake-resilient buildings in challenging environments.

Course Duration

5 days

Course Objectives

1. Understand the fundamentals of earthquake engineering and seismic risk assessment.
2. Develop advanced knowledge of seismic load calculation and structural response analysis.
3. Apply international seismic design codes and building standards effectively.
4. Master principles of performance-based seismic design (PBSD).
5. Analyze structural behavior under dynamic earthquake loading conditions.
6. Learn advanced techniques for earthquake-resistant reinforced concrete and steel structures.
7. Improve skills in structural modeling and seismic simulation software applications.
8. Evaluate building vulnerability and seismic performance levels.
9. Understand modern approaches to seismic retrofitting and structural rehabilitation.
10. Apply risk-informed design strategies for resilient infrastructure development.
11. Explore innovative solutions in smart buildings and resilient construction technologies.
12. Develop expertise in disaster-resilient urban development planning.
13. Enhance professional capability in delivering safe, sustainable, and future-ready structures.

Target Audience

1. Structural Engineers involved in building design and analysis.
2. Civil Engineers working in construction and infrastructure projects.
3. Architects interested in earthquake-resistant building concepts.
4. Construction Managers and Project Engineers.
5. Government and Municipal Building Regulation Professionals.
6. Engineering Consultants and Design Specialists.
7. Researchers and Academics in earthquake engineering.
8. Real Estate Developers and Infrastructure Investors.

Course Modules

Module 1: Fundamentals of Earthquake Engineering and Seismic Hazards

- Introduction to **earthquake mechanics, seismic waves, and fault systems**.
- Understanding **seismic hazards, risk assessment, and vulnerability analysis**.
- Principles of **earthquake-resistant structural design philosophy**.
- Overview of global seismic regions and building performance requirements.
- **Case Study:** Earthquake performance evaluation of buildings after the 2011 Japan earthquake.

Module 2: Seismic Design Principles and Building Codes

- Understanding international **seismic design standards and regulations**.
- Application of **IBC, Eurocode 8, ASCE 7, and regional seismic guidelines**.

- Calculation of seismic forces and design parameters.
- Importance of **ductility, strength, and structural redundancy**.
- **Case Study:** Code-based seismic design review of a high-rise building project.

Module 3: Structural Dynamics and Earthquake Response Analysis

- Fundamentals of **structural vibration and dynamic behavior**.
- Understanding natural frequency, damping, and modal analysis.
- Earthquake response spectrum and time-history analysis.
- Evaluation of structural displacement and acceleration responses.
- **Case Study:** Dynamic analysis of a multi-story reinforced concrete building.

Module 4: Seismic Analysis and Modeling Techniques

- Introduction to advanced **structural analysis and simulation methods**.
- Building analytical models for seismic performance evaluation.
- Application of **finite element analysis (FEA)** concepts.
- Nonlinear analysis and performance evaluation techniques.
- **Case Study:** Seismic modeling of a commercial building using structural analysis software.

Module 5: Earthquake-Resistant Design of Reinforced Concrete Buildings

- Design principles for **reinforced concrete seismic structures**.
- Detailing requirements for beams, columns, slabs, and shear walls.
- Understanding capacity design and plastic hinge formation.
- Improving structural ductility and energy dissipation.
- **Case Study:** Seismic design assessment of a reinforced concrete apartment tower.

Module 6: Seismic Design of Steel and Composite Structures

- Behavior of steel structures under earthquake loading.
- Design of moment-resisting frames and braced systems.
- Connection design for seismic performance.
- Composite structural systems and modern construction approaches.
- **Case Study:** Earthquake-resistant design of a steel industrial facility.

Module 7: Seismic Retrofitting and Structural Resilience

- Assessment methods for existing building seismic vulnerability.
- Retrofitting strategies using advanced strengthening systems.
- Application of dampers, base isolation, and energy dissipation devices.
- Improving resilience of aging infrastructure.
- **Case Study:** Retrofitting of heritage buildings after seismic damage.

Module 8: Advanced Seismic Technologies and Future Trends

- Emerging technologies in **smart seismic monitoring systems**.
- Artificial intelligence applications in earthquake risk prediction.
- Sustainable and resilient building design approaches.
- Digital twins and advanced structural health monitoring.
- **Case Study:** Smart building technologies implemented in earthquake-prone cities.

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

Start Date	End Date	Location	Price
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