

**COURSE NUMBER**

FHWA-NHI-130093

**COURSE TITLE****LRFD Seismic Analysis and Design of Bridges**

This course is a comprehensive and practical training course that addresses the requirements and recommendations of the seismic provisions in both the AASHTO LRFD Bridge Design Specifications and the AASHTO Guide Specifications for LRFD Seismic Bridge Design. The course reviews the fundamental principles of seismic design including engineering seismology, seismic and geotechnical hazards, and methods for modeling and analyzing bridges subject to earthquake ground motions. The course also discusses seismic capacity design methods of piers, foundations, superstructures and connections. Additionally, the course presents the principles and pros and cons of common seismic isolation techniques, typical isolation hardware, and construction and testing requirements consistent with the recently updated AASHTO Guide Specifications for Seismic Isolation Design. Lastly, the final lesson of the course addresses screening, evaluation, and selection of retrofit strategies and measures following closely to the philosophy and process described in the FHWA Seismic Retrofitting Manual for Highway Structures.

**OUTCOMES**

Upon completion of the course, participants will be able to:

- Identify geotechnical hazards and their impact on structural design
- Discuss what Earthquake Resisting Elements (ERE) are and explain why some are preferred and why some are not
- List three Describe the essential parts of the capacity design process
- Describe strategies for protecting bridge superstructures and methods for accommodating lateral displacements
- List the steps of foundation seismic design
- Describe the seismic analysis and design process in accordance with the AASHTO LRFD Bridge Design Specifications (LS) and AASHTO Seismic Guide Specifications (GS).
- Develop design response spectrum
- Describe common processes embedded in both the LS and GS and explain the key differences between the Force-Based (LS) and
- Displacement-Based (GS) Methods.
- Describe the key difference between the LS and GS seismic design methods
- List basic purposes, component and testing requirements for a seismic isolation system
- Describe common retrofitting measures for bridge superstructures, columns and foundations

**TARGET AUDIENCE**

This course is intended to engage a target audience of bridge engineers with zero and up to 20 years of experience, through instructor-led presentations, discussions, Q&A, group activities, walkthrough examples, hands-on student exercises, and demonstrations.

**TRAINING LEVEL:** Intermediate

**FEE:** 2021: \$660 Per Person; 2022: N/A

**LENGTH:** 5 DAYS (CEU: 3 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • [nhicustomerservice@dot.gov](mailto:nhicustomerservice@dot.gov)