**Course Number**
FHWA-NHI-130122

**Course Title**
Design and Evaluation of Bridges for Fatigue and Fracture

FHWA is offering a special incentive to promote this newly released, high-priority training. For a limited time and subject to availability, DOT’s who host the course can receive 20 seats at no cost. However, any additional seats must be purchased at regular price, either by DOT or by outside participants. We request that course be advertised to the local consultant community to maximize participation. DOTs can only take advantage of this incentive once.

This two-day training course presents relevant issues related to fatigue and fracture in steel bridges, including analysis, design, evaluation, repair, and retrofit. It is based on the AASHTO LRFD Bridge Design Specifications, Eighth Edition, as well as the AASHTO Manual for Bridge Evaluation, Second Edition, with Interim Revisions through 2016. Participant Exercises, Guided Walk Throughs, and videos are included throughout the training to aid bridge engineers with the implementation of the presented information.

This course consists of three modules. The first module serves as a general introduction to the class. The second module covers fundamentals, and it includes four lessons - Introduction to Fatigue and Fracture, Crack Growth in Steel Structures, Theory, and Characterizing Fatigue and Fracture in Bridge Members. The third module covers application, and it includes five lessons - Analysis for Fatigue, AASHTO Design Approach for Fatigue, AASHTO Design Approach for Fracture, AASHTO Evaluation Approach, and Retrofit and Repair.

The curriculum materials include a comprehensive Reference Manual in CD format (FHWA Publication No. FHWA-NHI-16-016), lecture and workshop exercises intended to promote or enhance a working knowledge of AASHTO LRFD, and a participant workbook for lecture notes and exercises.

Individuals attending this course should have a minimum BSCE degree. They should also have a working knowledge of the current AASHTO LRFD Bridge Design Specifications and should have relevant design experience using this specification on at least one steel bridge superstructure.

There are no NHI prerequisites for this course. However, select topics of this course are also addressed in NHI Courses 130078 (Fracture Critical Inspection Techniques for Steel Bridges), 130081 (LRFD for Highway Bridge Superstructures), and 130095 (LRFD and Analysis of Curved Steel Highway Bridges).

**Outcomes**
Upon completion of the course, participants will be able to:
- Explain the fundamentals of fatigue and fracture on steel highway structures
- Identify the various analysis methods for determining fatigue and fracture considerations on steel highway structures
- Explain the various AASHTO methodologies as it pertains to fatigue and fracture design
- Identify the AASHTO methodology for fatigue and fracture evaluation
- Describe the various strategies for repair and retrofit of steel highway structures

**Target Audience**
The primary audience for this course includes State DOT Bridge and Structures Engineers and Practitioners responsible for steel bridge design and evaluation. The target audience includes engineers at all levels, including designers, consultants, reviewers, maintenance and management engineers, and load raters.

**Training Level:** Intermediate

**Fee:** 2020: $315 Per Person; 2021: N/A

**Length:** 2 DAYS (CEU: 1.3 UNITS)

**Class Size:** MINIMUM: 20; MAXIMUM: 30

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