ABOUT THE COURSE

This course provides an overview on the fatigue behaviour of old metallic bridges. It reviews cases of fatigue damage encountered in such bridges and covers fatigue assessment procedures for the most fatigue-critical details associated with old riveted bridges. The parameters that affect the fatigue performance of riveted details will be discussed. The course will also review advanced methods that can be utilised for improved fatigue assessment of old metallic bridges.

COURSE OUTLINE

Wednesday 29th November

09:00 — 10:30
Lecture 1: Overview on Old Metallic Bridges
Overview of different types old metallic bridges; Experiences from bridge failures and damage cases. Overview of different types of old metals; cast-iron; wrought-iron, old mild steel.

10:45 — 12:15
Lecture 2: Introduction to Fatigue of Bridges
Fatigue process; Cyclic loading; Fatigue damage initiation and propagation; S-N curves; Fatigue design code principles.

13:30 — 15:00
Lecture 3: Fatigue Assessment Procedures for Existing Bridges
Different levels of fatigue assessment; Fatigue properties of old structural steel; S-N curves; NDT and inspection methods.

15:30 — 17:00
Lecture 4: Fatigue Behaviour of Riveted Bridges
Historical overview of riveting; clamping force; Review of fatigue tests on riveted bridge members. Parameters that affect the fatigue performance of riveted bridges.

Thursday 30th November

09:00 — 10:30
Lecture 5: Fatigue Behaviour of Riveted Connections
Review of fatigue tests on riveted connections; Fatigue behaviour of stringer-to-floor-beam connections and parameters that affect their fatigue performance.

10:45 — 12:15
Lecture 6: Load Spectra for Old Railway Bridges
Generation of load spectra for the purposes of fatigue assessment; the importance of load spectrum accuracy; influence of historical loading; effects of dynamic amplification.

13:30 — 15:00
Lecture 7: Fatigue Crack Growth Analysis
Fracture Mechanics analysis of cracked bridge details; Advantages of crack growth analysis versus the traditional S-N method; inspection and maintenance planning through Fracture Mechanics.

15:30 — 17:00
Lecture 8: Improved Fatigue Assessment Methods
Advanced methods of fatigue assessment; Probabilistic methods; Finite element analysis.

COST

Course fee will be **£500 (plus VAT for UK residents)** which includes course notes and lunches. The fee doesn’t include accommodation. You should make your own arrangements for accommodation.

VENUE

(TBC)
ABOUT THE LECTURER

Dr Boulent Imam is Senior Lecturer at the Department of Civil & Environmental Engineering at the University of Surrey and Programme Director for the postgraduate courses in Bridge Engineering and Infrastructure Engineering & Management. His expertise lies in the area of bridge management, fatigue of structural systems, risk & reliability and climate change adaptation. Dr Imam’s PhD concentrated on the development of improved fatigue assessment methods for riveted railway bridges and was carried out in collaboration with Network Rail. Through the European project BriFaG (Bridge Fatigue Guidance), he has contributed towards the drafting of advanced European guidelines for the fatigue design of new and fatigue assessment of existing steel bridges. Through the European project MAINLINE, he developed a framework for life cycle cost analysis and environmental impact assessment of railway bridge maintenance. Recently, he has been investigating the effects of climate change on bridge scour risk and long-term deterioration of metallic bridges. Dr Imam has extensively collaborated with Network Rail and other European infrastructure owners and managers.

REGISTRATION

☐ I wish to register for the course at a cost of £500 (Plus VAT for UK residents) including course material and workshop lunches.

*Payments can be made by cheque (made payable to ASRANet Ltd.), cash or bank transfer but no card payments. Please enquire for details.*

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Signed

Date

The completed form should be sent to: info@asranet.co.uk OR to ASRANet Ltd, 5 St Vincent Place, Glasgow, G1 2DH UK

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