ABOUT THE COURSE

This course provides a wide range of modules addressing the whole life analysis of bridge structures. The course starts with a brief introduction to the basic life cycle management of bridges. Systems for bridge management will also be discussed. The course will overlook the use of stochastic modelling for performance and the application of maintenance planning methods. Special attention will be given to fatigue analysis for design of new and assessment of existing metallic bridges as well as long-term deterioration modelling for metallic bridges.

COURSE OUTLINE

Thursday 12th October

09:00 — 10:30
Lecture 1: The basis of life-cycle infrastructure asset management (LIAM)
By Dr Zanyar Mirzaei
This session will introduce the most common frameworks and models of infrastructure asset management. The lecture covers an overview of the key parameters in decision making for infrastructures, the definition of performance, and level of service, common methods to assess the ability of the infrastructure to provide the level of services.

10:30 — 10:45
Break

10:45 — 12:15
Lecture 2: Bridge Management Systems
By Dr Zanyar Mirzaei
In this session an overview of existing bridge management systems of the world will be presented. The lecture covers the structure of bridge management systems including the necessary modules, IT capabilities, prediction capabilities, planning modules and operation information. The important modules will be discussed in detail through example systems from Switzerland and Canada.

12:15 — 13:30
Lunch

13:30 — 15:00
Lecture 3: Stochastic Performance Modelling
By Dr Zanyar Mirzaei
In this session an overview of state-of-the-art and state the practice in modelling performance of bridges will be presented. The lecture will cover the basis to simulate the life-cycle performance stochastically, from the use of random variables and joint probability to the hazard function and the classical Markov model.

15:00 — 15:30
Break

15:30 — 17:00
Lecture 4: Maintenance Planning Models
By Dr Zanyar Mirzaei
This session introduces the definition of intervention concept, optimal intervention strategies and optimal work programs. The lecture will cover an overview of important global and local (from Switzerland) standards and guidelines, and the organization of the key components for the life-cycle maintenance of bridges. The application of the most important methods to determine sustainable intervention work programs will be discussed through the use of real world examples.

Friday 13th October

09:00 — 10:30
Lecture 5: A Framework for Life Cycle Analysis of Bridges
By Dr Boulent Imam
This session will introduce the framework for life cycle analysis of bridge structures, presenting the models that are available for quantifying life cycle costs capturing both direct costs associated with the maintenance activities as well as indirect costs associated with the unavailability of the service of the bridge.

10:30 — 10:45
Break

10:45 — 12:15
Lecture 6: Long Term Deterioration Modelling - Metallic Bridges
By Dr Boulent Imam
This session will focus on Fracture Mechanics, which explicitly captures the initiation and propagation behaviour of fatigue cracks, and how it can effectively be used for maintenance planning of steel bridge details, especially in the event where cracks have been detected through inspection

12:15 — 13:30
Lunch

13:30 — 15:00
Lecture 7: Fatigue Analysis of Metallic Bridges
By Dr Boulent Imam
The session will start by an introduction to the phenomenon of fatigue in metallic bridges and briefly present the theoretical background behind it. The parameters that affect fatigue damage and available models for prediction of fatigue damage accumulation and remaining fatigue life, employed in codes of practice, will be presented.

15:00 — 15:30
Break

15:30 — 17:00
Lecture 8: Fracture Mechanics Analysis of Metallic Bridges
By Dr Boulent Imam
The session will start by an overview of the most important parameters affecting long term deterioration of metallic bridges. Focus will be given to atmospheric corrosion and available models for the prediction of deterioration rates in metallic bridges will be presented.

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

Hotel Montana (TBC)
Konradstrasse 39
CH-8005 Zürich
Zurich

LIFE CYCLE MANAGEMENT OF BRIDGES
12-13 October 2017
London
ABOUT THE LECTURERS

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. 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. Dr Imam has extensively collaborated with Network Rail and other European infrastructure owners and managers.

Dr Zanyar Mirzaei is an Infrastructure Consultant at the Gruner AG based in Zurich. He has been the executor of several research projects in the field of infrastructure maintenance in different Institutes such as the Swiss Federal Laboratories for Materials Science and Technology (EPMA), the Institute of Construction Material at University of Tehran (CMI), and the Institute of Construction and Infrastructure Management at ETH Zurich. Over the last a few years, working closely with the developers of the main Bridge Management Systems in Canada and Switzerland, he has been investigating several state-of-the-art and state-of-practice methodologies to determine optimal maintenance programs for bridges and testing these methodologies with real bridges from Canton of Wallis in Switzerland. He has held several lectures, workshops, and seminars about sustainable maintenance programs for bridges in Switzerland, USA, Canada, Brazil, Iran, China, and Italy. Since 2012 Dr Mirzaei is a member of Bridge Management Committee at the International Association for Bridge Maintenance and Safety, under which he has developed the online database and the international reports on the Bridge Management Systems of the world, i.e., "Overview of existing Bridge Management Systems" 2012 and 2014.

REGISTRATION

☐ I wish to register for the course at a cost of **£750 (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.*

☐ Please invoice me at the below address

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