JCSS Continuing Education & Advanced School

Structural Reliability and Probabilistic Model Code & Risk Informed Decision Making and Decision Analysis

Organized by：

- The Joint Committee on Structural Safety (JCSS)
- Tongji University
- Harbin Institute of Technology
- Beijing University of Technology

Co-organized by：

- Committee on Random Vibration, Chinese Society of Vibration Engineering (CSVE)

Increased Interest In Risk and Reliability

Methods of reliability, risk and safety assessment are increasingly gaining importance as decision support tools in various fields of engineering. In order to utilize these methods and to exploit their potential in industrial applications, an understanding of the fundamental principles is necessary. The Advanced School aims at educating engineers and researchers to work more efficiently in supporting decision makers and clients for a sustainable societal development.

JCSS

The JCSS is a committee in the field of Structural related Risk and Reliability, acting on behalf of the Liaison Committee of the following six international professional associations:

- CIB International Council for Research and Innovation in Building and Construction
- ECCS European Convention for Constructional Steelwork
- fib International Federation for Structural Concrete
- IABSE International Association for Bridge and Structural Engineering
- RILEM Reunion internationale des Laboratoires et Experts des Materiaux
- IASS International Association for Shell and Spatial structures

The goals of the JCSS are:

- To provide general knowledge and decision support for the life-cycle based management of safety, reliability, risk, robustness, durability, resilience and sustainability for the built environment, on the basis of sound scientific principles and with an open eye for the applications in practice.
- To take care that inter-associational pre-normative research in the field of Risk and Reliability is performed in an effective and adequate way.
- To strive for coordination between the interassociational pre-normative research and normalization activities in ISO, Eurocode etc.
- To provide appropriate support and technical co-ordination for the work of the Member Associations.

JCSS Advanced School Description

The JCSS Continuing Education and Advanced School provides a deep and thorough insight in the latest developments in the concepts and tools for probabilistic structural reliability engineering and risk informed decision making. The advanced school consists of 3 courses which will be held consecutively:

Part 1: Probabilistic Modelling and Risk Analysis in Engineering (28 June – 3 July 2018, Tongji University, Shanghai, China)
Part 2: The JCSS Probabilistic Model Code (29 June – 4 July 2019, Tongji University, Shanghai, China)
Part 3: Risk Informed Decision Making and Decision Analysis (29 June – 4 July 2019, Tongji University, Shanghai, China)

Benefits

The participants benefit by becoming able to master the methods of reliability, risk and safety assessment for engineering projects. Furthermore, the participants can offer clients new services in the perspective of benefit and risk informed decision support.

Who should attend?

Engineers involved in probabilistic structural analysis, design and reliability assessment, as well as engineering supervisors and managers will benefit from this course. Further, master and PhD students and academics working in the field of structural risk assessment will profit from this course. Participants are expected to have basic knowledge on basic probability theory, statistics, linear algebra and elementary structural analysis (static/dynamic).

Information and course plan Part 2 & Part 3

Structural Reliability and JCSS Probabilistic Model Code & Risk Informed Decision Making and Decision Analysis

Time and Location

The course on Structural Reliability and JCSS Probabilistic Model Code & Risk Informed Decision Making and Decision Analysis will be held from the **29 June to 4 July 2019**. The course location will at **Tongji University**.

Learning Methods and Activities

Learning methods and activities comprise lectures, practical exercises and self-studies. Self-study assignments will typically consist of calculations that develop understanding of the materials presented in class. Participants will be made familiar with the state-of-the-art computational methods and software in this field.

Evaluation and Diploma

Course Diplomas are issued by the JCSS on the basis of active course participation and a positive evaluation of the provided material by the participant.

Course Materials

Course compendium, books, selected research reports and papers from journals and conferences.

Lecturers

Michael H. Faber, President of JCSS
Professor of Risk and Safety
Professor, Department of Civil Engineering
Aalborg University, Denmark

J. D. Sørensen, Former President of JCSS
Professor, Department of Civil Engineering
Aalborg University, Denmark

Matthias Schubert
Doctor
CEO, Matrisk GmbH, Switzerland

Jie Li
Distinguished Professor
Director, International Joint Research Center for Engineering Reliability and Stochastic Mechanics (CERSM)
College of Civil Engineering, Tongji University, China
President of the International Association for Structural Safety and Reliability (IASSAR)

Jianbing Chen
Professor, College of Civil Engineering & State Key Laboratory of Disaster Reduction in Civil Engineering
International Joint Research Center for Engineering Reliability and Stochastic Mechanics (CERSM)
Tongji University, China

Dagang Lu
Professor, Vice Dean
School of Civil Engineering
Harbin Institute of Technology, China

Zhaohui Lu
Professor, College of Architecture and Civil Engineering
Beijing University of Technology, China

Yongbo Peng
Professor, Shanghai Institute of Disaster Prevention and Relief, & State Key Laboratory of Disaster Reduction in Civil Engineering
International Joint Research Center for Engineering Reliability and Stochastic Mechanics (CERSM)
Tongji University, China

Costs and Registration

Due to the sponsorship of Tongji University a reduced attendance fee applies for all participants. The reduced attendance fee is **2400 RMB Yuan per person for regular participant and 1800 RMB Yuan per person for PhD/graduate students** and includes lecture materials. Tea breaks between the lectures are provided. Registration form is required via email to Mr. Jiashu Yang (E-mail: jiashuyang@tongji.edu.cn by **25 May 2019**.

Contacts

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E-mail: chenjb@tongji.edu.cn

Course Plan (Tentative)

07:30-18:00, 29 June 2019, Registration, Venue: Civil Engineering Building A101

DAY 1, Saturday, 29 June 2019, Venue: Civil Engineering Building A101	
Morning	
8:30-9:30	Opening
10:00-12:00	Probability theory, Uncertainties and random variables
Afternoon	
14:00-15:45	Properties of random variables, Distributions
16:15-18:00	Presented exercises

DAY 2, Sunday, 30 June 2019, Venue: Civil Engineering Building A101	
Morning	
8:30-10:00	Random processes and probabilistic model building -I
10:20-12:00	Random processes and probabilistic model building –II Including extreme value theory, first-passage problem
Afternoon	
14:00-15:45	Regression analysis
16:15-18:00	Presented exercises

DAY 3, Monday, 1 July 2019, Venue: Civil Engineering Building A101	
Morning	
8:30-10:00	Structural reliability
10:20-12:00	Time Independent Reliability Methods
Afternoon	
14:00-15:45	Time Independent System Reliability Methods
16:15-18:00	Presented exercises

DAY 4, Tuesday, 2 July 2019, Venue: Civil Engineering Building A101	
Morning	
8:30-10:00	Time Dependent System Reliability Methods, random vibrations – I
10:20-12:00	Time Dependent System Reliability Methods, random vibrations – II
Afternoon	
14:00-15:45	Time Dependent System Reliability Methods -III Applications to probabilistic design of wind turbines
16:15-18:00	Presented exercises

DAY 5, Wednesday, 3 July 2019, Venue: Civil Engineering Building A101	
Morning	
8:30-10:00	Codes
10:20-12:00	Probabilistic Model Code, Resistance
Afternoon	
14:00-15:00	Probabilistic Model Code, Loads, Safety assessment of existing Structures
15:15-16:45	Global reliability of structures and systems
17:00-18:00	Robustness analysis of structures

DAY 6, Thursday, 4 July 2019, Venue: Civil Engineering Building A101	
Morning	
8:30-10:00	System risks modelling
10:20-12:00	System risks modelling
Afternoon	
14:00-15:45	Risk analysis and decision making
16:15-18:00	Presented exercises/case studies/Discussions