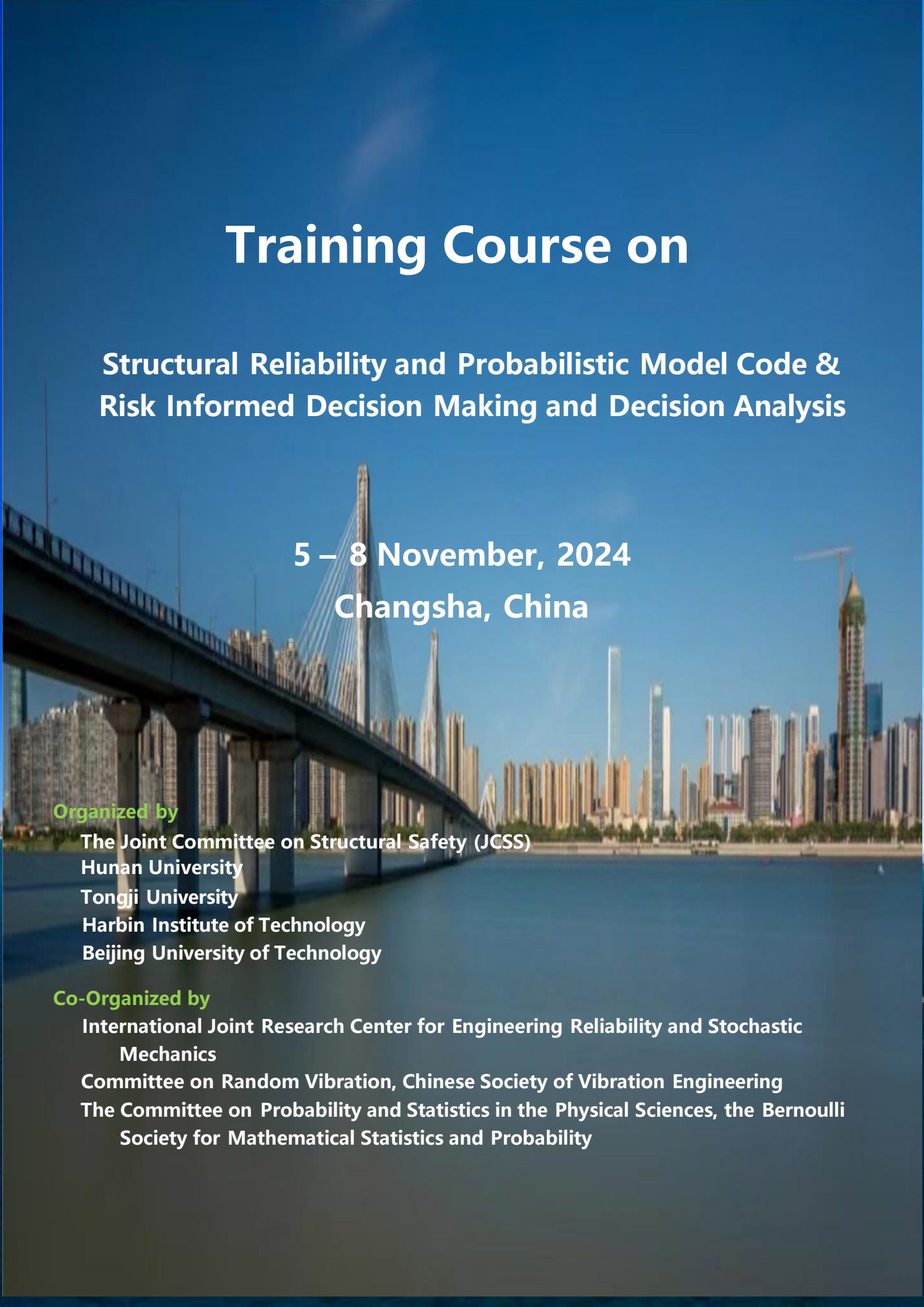
Training Course on

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



5 – 8 November, 2024

Changsha, China

Organized by

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

Co-Organized by

International Joint Research Center for Engineering Reliability and Stochastic Mechanics
Committee on Random Vibration, Chinese Society of Vibration Engineering
The Committee on Probability and Statistics in the Physical Sciences, the Bernoulli Society for Mathematical Statistics and Probability

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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 improve the general knowledge and understanding within the fields of safety, risk, reliability and quality assurance, for all types of civil engineering and building structures, 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.

JCSS Endorsed Training Course

The JCSS Endorsed training course 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.

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

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 **5 November to 8 November, 2024**. The course location will be at **Hunan 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

Jie Li

Academician of CAS, EASA
Former President of the International Association for Structural Safety and Reliability (IASSAR)
University Distinguished Chair Professor
College of Civil Engineering, Tongji University, China
Director, International Joint Research Center for Engineering Reliability and Stochastic Mechanics (CERSM)
A. M. Freudenthal medal recipient (bestowed by ASCE)

Michael H. Faber,

Former President of JCSS
Member of Danish Academy of Technical Sciences
Professor of Risk and Safety
Department of Built Environment, Aalborg University, Denmark
A. Cornell Award recipient (bestowed by the International Society for Civil Engineering Risk and Reliability (CERRA))

Jochen Köhler

President of JCSS
Department of Structural Engineering, Faculty of Engineering
Norwegian University of Science and Technology (NTNU), Norway

Yangang Zhao

Foreign Associate of Engineering Academy of Japan
Professor
Beijing University of Technology
Kanagawa University, Japan

Maria Pina Limongelli

Member of European Centre on Prevention and Forecasting of Earthquakes (ECPFE)
Reporter of WP3 of JCSS
Professor
Politecnico di Milano (Polimi), Italy

Jianbing Chen

Chair of the Executive Board, International Association for Structural Safety & Reliability
Reporter of WP1 of JCSS
University Distinguished Professor
College of Civil Engineering, Tongji University, China
Member of Board of Directors, International Civil Engineering Risk and Reliability Association (CERRA)
Humboldt Research Award Recipient

Dagang Lu
Member of JCSS
Professor
School of Civil Engineering, Harbin Institute of Technology, China
Vice Chairman of the Random Vibration Committee of CSVE

Yongbo Peng
Professor
Shanghai Institute of Disaster Prevention and Relief, Tongji University, China
Secretary of the Random Vibration Committee of CSVE

Jun Xu
Professor
College of Civil Engineering, Hunan University, China

Costs and Registration

The training course will be held onsite, with lectures delivered in both English and Chinese.

Thanks to the sponsorship of Hunan University, a reduced attendance fee is available for all participants. For those attending onsite, the fee is 2000 RMB per person for regular participants and 1800 RMB for PhD and graduate students. Tea breaks will be provided between lectures.

Please submit the registration form via email to Mr. Quanfu Yu at yuquanfu412@hnu.edu.cn by **October 25, 2024.**

Course Plan

14:00-21:00, 5 November 2024 (Tuesday), Registration

DAY 1, Wednesday, 6 November 2024	
Morning	
8:30-8:50	Opening **Prof. Jochen Köhler, Prof. Jie Li**
8:50-9:30	Overview **Prof. Jianbing Chen**
10:00-10:45	Uncertainties, probability theory, random variables **Prof. Jun Xu**
11:00-11:45	Properties and distributions of static loads **Prof. Jun Xu**
Afternoon	
14:00-14:45	Random processes and probabilistic model building (I): Basic theory **Prof. Jianbing Chen**
15:00-15:45	Random processes and probabilistic model building (II): Earthquakes, wind and waves **Prof. Yongbo Peng**
16:00-16:45	Regression analysis **Prof. Dagang Lu**
17:00-17:45	Global reliability of structures and systems **Prof. Jie Li**

DAY 2, Thursday, 7 November 2024	
Morning	
9:00-9:45	Structural reliability, including definition and time Independent Reliability Methods (FORM), etc. **Prof. Yangang Zhao**
10:00-10:45	Time Independent Reliability Methods, including SORM, high-order moment methods, etc. **Prof. Yangang Zhao**
11:00-11:45	Time Independent System Reliability Methods **Prof. Dagang Lu**

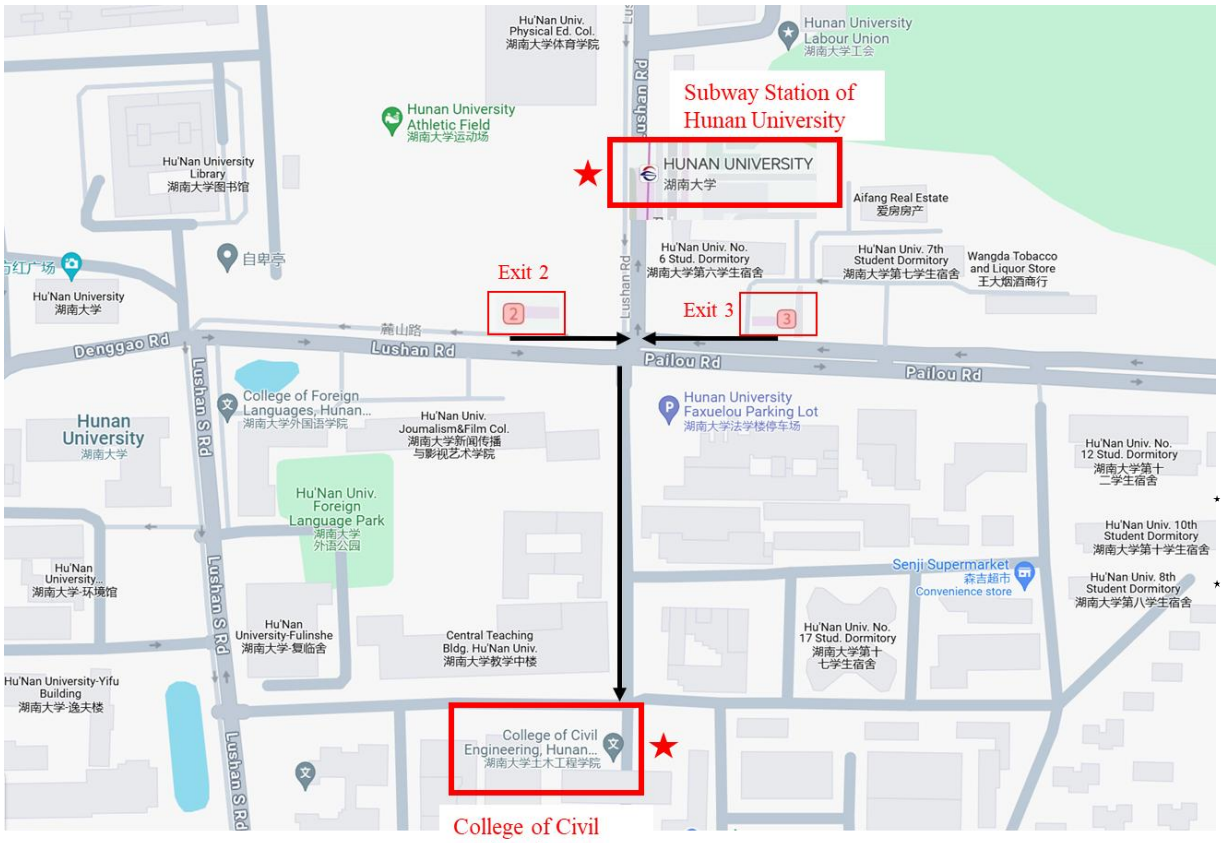
Afternoon	
14:00-14:45	Probabilistic Model Code, Resistance, Loads (including extreme value theory), Safety assessment of existing structures **Prof. Jochen Köhler**
15:00-15:45	Code calibration **Prof. Jochen Köhler**
16:00-16:45	Value of information in Structural Health Monitoring **Prof. Maria Pina Limongelli**
17:00-17:45	Bayesian update of probabilistic models **Prof. Maria Pina Limongelli**

DAY 3, Friday, 8 November 2024	
Morning	
9:00-9:45	Stochastic dynamics, Time dependent system reliability methods – I, including first-passage problem **Prof. Jianbing Chen**

10:00-10:45	Stochastic dynamics, Time dependent system reliability methods, – II, including probability density evolution method **Prof. Yongbo Peng**
11:00-11:45	Presented exercises/case studies/Discussions

Afternoon	
14:00-14:45	Robustness analysis of structures **Prof. Michael H. Faber**
15:00-15:45	Risk analysis and decision making **Prof. Michael H. Faber**
16:00-16:45	Presented exercises/case studies/Discussions
17:00-17:45	Closure **Prof. Jochen Köhler, Prof. Jianbing Chen**

Map & Transportation



Changsha Huanghua International Airport:

- Metro Line 6 to Metro Line 4 (transfer at Liugoulong Station, approximately 1 hour and 20 minutes)
- Maglev Express to Metro Line 4 (transfer at Changsha South Railway Station, approximately 1 hour and 10 minutes)
- Taxi: about 70 RMB

长沙黄花国际机场:

- 地铁六号线-地铁四号线(六沟垅站中转，约1小时20分钟)
- 磁浮快线-地铁四号线(长沙高铁南站中转，约1小时10分钟
- 打车约70元

Changshanan Railway Station:

- Metro Line 4 (approximately 35 minutes)
- Taxi: about 40 RMB

长沙高铁南站：

- 地铁四号线 (约35分钟)
- 打车约40元

Contacts

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