NANYANG TECHNOLOGICAL UNIVERSITY

Qualified for 12 PDUs by PEB

Short Course

On

Fire Design of Steel and Composite Structures to EC3 and EC4

Dates

19 and 20 September 2016
(Monday & Tuesday)

Time

Day 1: 9:00 am – 4:30 pm
Day 2: 9:00 am – 5:00 pm

Venue

CEE Seminar Room A (N1-B1b-06)
School of Civil & Environmental Engineering
Nanyang Technological University

Course Instructors

	
Prof Venkatesh KODUR	**Prof TAN Kang Hai**
Department of Civil & Environmental Engineering, Michigan State University	School of Civil & Environmental Engineering, Nanyang Technological University

Organised by:

Protective Technology Research Centre
School of Civil & Environmental Engineering
College of Engineering
Nanyang Technological University

~~~ COURSE OUTLINE ~~~

The concept of structural safety, and in particular how structures are designed under extreme loading conditions, has come under increased focus since the collapse of WTC buildings following 9-11 disaster. Since fires played a crucial role in the collapse of WTC buildings, building performance under fire conditions has attracted significant attention in recent years. Further, there is an increased expectation from society-at-large on better performance of buildings under fire conditions. Thus structural engineers are expected to be familiar with the design principles governing fire safety in buildings. This course will provide the essential background for fire design of steel, and composite structures. Both behavior and design aspects related to structural fire design of steel, and composite structures will be covered in this course.

The course will introduce design provisions specified in Euro codes for fire design of steel, concrete, and composite structures. For engineers who are not familiar with the "Euro-terminology", the course instructors will go through the relevant terms for ambient and high temperature design. Also, examples and case studies will be presented to illustrate the applicability of fire design provisions in practical scenarios. Both Professors have been working in the field of structural fire engineering since 1990s and have extensive experience in the analysis, design and testing of steel, concrete and composite structures under fire conditions.

~~~ COURSE CONTENT ~~~

19 September 2016, Monday	***20 September 2016, Tuesday***
1. Introduction to Fire Safety and General Presentation of the Eurocodes 2. Eurocode 1 - Actions in Case of Fire 3. The Structural Eurocodes 4. Eurocode 3 for Steel Structures: Calculation of Temperatures in Protected and Unprotected Steel Structures 5. Fire Resistance Tests - Fire Resistance Evaluation through Testing 6. Eurocode 3 and 4 for Structures: Application of Computer Models (SAFIR/ANSYS)	7. Eurocode 3 for Steel Structures: Structural Analysis of Members subjected to Fire 8. Eurocode 4 for Composite Steel-Concrete Structures: Composite Floors - Traditional Approach 9. Eurocode 4 for Composite Steel-Concrete Structures: Composite Columns 10. Eurocode 4 for Composite Steel-Concrete Structures: Composite Beams 11. Design Commentary for P288 and P390 for Composite Floor Deckings under Fire **(NEW)** 12. Science behind WTC Buildings Collapse; Recent Developments in US Codes and Standards on Fire Safety Provisions **(NEW)**

~~~ WHO SHOULD ATTEND ~~~

This course has been developed to primarily cater to practicing Civil, Structural, Mechanical, and Fire protection engineers who require a working knowledge of structural fire design of buildings. The course is also highly relevant to regulatory (building code) officials and scholars and post graduate students of the built environment.

~~~ ABOUT THE INSTRUCTORS ~~~

Venkatesh KODUR *Ph.D., P.E., F.ASCE, F.ACI,F.SEI, F.CAE, F.INAE*

Dr Venkatesh KODUR is Professor and Director of the Center on Structural Fire Engineering and Diagnostics, Department of Civil & Environmental Engineering, Michigan State University, USA. His research is focused on the experimental behavior and analytical modeling of structural systems under extreme fire conditions, constitutive modeling of material properties at elevated temperatures, developing guidelines for fire design of structural systems, evaluating fire performance of high performing materials, performance based fire safety design, and building collapse investigations. He has published over 300 peer-reviewed journal and conference papers in Structural Fire Engineering field, and also has given numerous invited keynote presentations. Dr Kodur was part of the FEMA/ASCE Building Performance Assessment Team that studied the collapse of the World Trade Center buildings in New York as a result of the September 11, 2001 incidents.

Kang Hai TAN *BSc(Eng), PhD, PEng, MIES, MASCE*

Dr TAN Kang Hai is Professor of Structural Engineering and Associate Chair (Research) in the School of Civil and Environmental Engineering, NTU. He is concurrently the Co-Director of Transport Research Centre and Director of Protective Technology Research Centre in NTU. Prior to joining NTU, he worked in Ove Arup & Partners, UK. He is a registered Professional Engineer in Singapore. He works on numerical simulations of the fire effects on structures and experimental testing of sub-assemblies using electrical heating furnaces. Since 1996, he and his research team have developed finite element software FEMFAN3D to be used for progressive collapse analysis of structures. He also served as Chairman of a few task force groups on Structural Eurocodes relating to structural fire applications. He has been regularly conducting professional short courses and seminars on Eurocodes for reinforced concrete and steel structures and Structural Fire Engineering in Singapore, Hong Kong and China. He has written close to 150 SCI international journal papers and another 178 international conference articles on structures. In 2014, he received a SGD$6 million research grant on "Life Safety and Structural Fire Safety of Mega Underground Caverns in Singapore" from the Ministry of National Development (MND).

Short Course Organised by Protective Technology Research Centre
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Venue	CEE Seminar Room A, N1-B1b-06 Nanyang Technological University 50 Nanyang Avenue, Singapore 639798		
Fees	**S$500/- per person** • Fees include 7% GST, refreshments, lunches, and course materials. • Please submit the scanned registration form at least 7 working days before the commencement of the short course (d-ptrc@ntu.edu.sg). • There will be no refund of fees for any cancellation made. However, a replacement can be made at no extra charge. • Registration will be confirmed upon the receipt of the registration form.		
PDUs	12		

Registration Form

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Attn: Ms Debbie Low

For registration and enquiries, please send your email to d-ptrc@ntu.edu.sg .
Tel: 6790 5285