



NANYANG
TECHNOLOGICAL
UNIVERSITY

Short Course

On

**Fire Safety
Engineer (FSE):
14 CPE Hours**

Performance Based Fire Resistance Design of Steel, Concrete and Composite Structures to Eurocodes 1, 2, 3 & 4

Dates

22nd and 23rd May 2015
(Friday & Saturday)

Time

9.00 am – 5:30 pm

Venue

CEE Seminar Room A (N1-B1b-06)
Block N1, Basement 1, Section B, Room 06
School of Civil & Environmental Engineering
Nanyang Technological University

Course Instructor


Professor Yong Chang WANG
School of Mechanical, Aerospace and Civil Engineering, University of Manchester

Organised by:

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

~~~ COURSE OUTLINE ~~~

Eurocodes have been adopted by many countries, including Europe and Asia, for structural design for many years. For each of the Eurocodes for structural design using different construction materials, such as steel and concrete, there is always a section (Part 1.2) devoted to performance-based structural fire engineering design. Indeed, structural fire engineering design is always an essential part of a complete building design. However, there is a knowledge gap for both structural engineers and fire safety engineers in carrying out a complete performance-based structural fire engineering design. This is due to the fact that structural engineers performing structural analysis rely on the knowledge of how heat is transferred to the structure whereas fire safety engineers assessing structural fire protection requirements rely on the results of structural analysis performed by structural engineers.

This short course is aimed to bridge this gap. It will meet the need for knowledge in the performance-based fire design concept as well as detailed design procedures. It encompasses both the fire behaviour and structural design for a complete structural fire engineering design process. In this course, steel, concrete and steel/concrete composite structures will be covered in details with examples. Methods of using unprotected steelwork will also be introduced.

~~~ COURSE CONTENT ~~~

22 May 2015, Friday	23 May 2015, Saturday
1. Overview of Performance Based Procedure for Fire Resistance Structural Design	6. Eurocodes 3 & 4 for Steel & Composite Columns
2. Fire Behaviour and Temperature Predictions of Compartments under Different Fire Scenarios	7. Concrete Filled Tubes (Design Guide and Software)
3. Heat Transfer in Structural Members: Heat Conduction; Heat Transfer Coefficients; Simplified Analytical Methods; Steel Connections	8. Cardington Fire Tests & Tensile Membrane Action of Composite Floors under Fire
4. Methods of Fire Protection and Thermal Properties of Fire Protection Materials	9. Steel Structures without Fire Protection
5. Eurocodes 2, 3 & 4 for Steel, Concrete, and Composite Beams & Slabs	10. Robustness of Structures in Fire

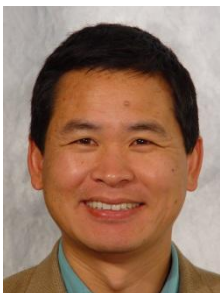
~~~ WHO SHOULD ATTEND ~~~

This course has been developed primarily to serve Structural, Civil Engineers and Fire Engineers, who need a working knowledge of fire resistance design calculations for building design. The course is also applicable to Contractors and Builders, Building Surveyors, Building Services Engineers, Fire Engineering Researchers, Fire Brigades, Architects, and Building Code Drafters.

~~~ ABOUT THE INSTRUCTOR ~~~

Yong Chang WANG

BEng, PhD, FStructE, CEng



Professor WANG is Chair Professor of Structural and Fire Engineering at the University of Manchester. Prior to joining the University of Manchester in 1997, he was a core member of the BRE team that carried out the influential Cardington Structural Fire tests. Shortly after joining the University of Manchester, he developed the highly successful Fire Engineering course module which he continues to teach. He has run a number of similar short courses in the UK and overseas. Professor Wang's current research interests include fire engineering design of steel, concrete and composite structures and fire protection materials. He has published two books (one sole author and one lead author) on performance based engineering of structures and numerous relevant research papers. His research has resulted in significant practical impacts. In particular, he is the author of the Tata Steel Design guide

on Concrete Filled Steel Tubular (CFST) columns and supervised the development of the accompanying software FireSoft. The CFST design guide and software have now been used in many projects. He is a member of the British Standards Institute committee on Composite Structures and represents the UK on the Eurocode 4 Part 1.2 (EN 1994-1-2) Working Group responsible for the future development of this Eurocode. In 2011, he was awarded the Henry Adams Diploma by the Institution of Structural Engineering for the best research paper published in The Structural Engineers in 2010.

Short Course Details

Short Course: Performance Based Fire Resistance Design of Steel, Concrete and Composite Structures to Eurocodes 1, 2, 3 & 4

Date	22 & 23 May 2015 (Friday & Saturday)	Time	9.00 am – 5.30 pm
Venue	CEE Seminar Room A, N1-B1b-06 Nanyang Technological University 50 Nanyang Avenue, Singapore 639798		
Fees	<p>S\$580/- per person if attending 2 days of the course S\$350/- per person if attending only 1 day of the course</p> <ul style="list-style-type: none"> Fees include 7% GST, refreshments, lunches, and course materials. Please send the registration form with payment <u>at least 10 working days</u> before the commencement of the short course. 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. 		

Registration Form

Organisation			
Address			
Contact Person		Email	
Tel no.		Fax no.	

We wish to register for the following person(s)

1.	Name	Designation	
	Email	Contact No.	
2.	Name	Designation	
	Email	Contact No.	
3.	Name	Designation	
	Email	Contact No.	

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Cheque payable to **“Nanyang Technological University”** and mail it

To : Nanyang Technological University
 Protective Technology Research Centre
 School of Civil & Environmental Engineering
 Blk N1.1-B3-03, 50 Nanyang Avenue, Singapore 639798
 Tel: 6790 5285
 Attn to: Ms Debbie Low

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

NTU - Protective Technology Research Centre

2-Day Short Course: Performance Based Fire Resistance Design of Steel, Concrete and Composite Structures to Eurocodes 1, 2, 3 & 4

Date: 22 – 23 May 2015, Fri and Sat

Venue: CEE Seminar Room A, N1-B1b-06, NTU

Course Instructor:

Professor WANG Yong Chang

Chair Professor of Structural and Fire Engineering, University of Manchester

Course Schedule

Day 1: 22 May 2015 (Friday)

TIME	COURSE SCHEDULE
8:45am – 9:00am	<i>Registration</i>
9:00am – 10:30am	1. Overview of Performance Based Procedure for Fire Resistance Structural Design
10:30am – 10:45am	<i>Tea/Coffee</i>
10:45am – 11:45am	2. Fire Behaviour and Temperature Predictions of Compartments under Different Fire Scenarios
11:45am – 12:45pm	3. Heat Transfer in Structural Members: Heat Conduction; Heat Transfer Coefficients; Simplified Analytical Methods; Steel Connections
12:45pm – 1:45pm	<i>Lunch</i>
1:45pm – 2:45pm	3 (Cont'd). Heat Transfer in Structural Members: Heat Conduction; Heat Transfer Coefficients; Simplified Analytical Methods; Steel Connections
2:45pm – 3:45pm	4. Methods of Fire Protection and Thermal Properties of Fire Protection Materials
3:45pm – 4:00pm	<i>Tea/Coffee</i>
4:00pm – 5:30pm	5. Eurocodes 2, 3 & 4 for Steel, Concrete, and Composite Beams & Slabs

Day 2: 23 May 2015 (Saturday)

TIME	COURSE SCHEDULE
9:00am – 10:30am	6. Eurocodes 3 & 4 for Steel & Composite Columns
10:30am – 10:45am	<i>Tea/Coffee</i>
10:45am – 11:45am	7. Concrete Filled Tubes (Design Guide and Software)
11:45am – 12:45pm	8. Cardington Fire Tests & Tensile Membrane Action of Composite Floors under Fire
12:45pm – 1:45pm	<i>Lunch</i>
1:45pm – 2:45pm	8 (Cont'd). Cardington Fire Tests & Tensile Membrane Action of Composite Floors under Fire
2:45pm – 3:45pm	9. Steel Structures without Fire Protection
3:45pm – 4:00pm	<i>Tea/Coffee</i>
4:00pm – 5:30pm	10. Robustness of Structures in Fire