Fire Dynamics and Modelling

Monday 23 – Friday 27 October 2017

15% discount for IFE Members
Fire Dynamics and Modelling

Monday 23 – Friday 27 October 2017

Course Director: Dr Roth Phylaktou, School of Chemical and Process Engineering

Background to the course

Each year, fires and explosions claim a greater toll than earthquakes and floods and all other natural disasters combined. Some single incidents cost millions of pounds, such as the Windsor Castle fire. Explosion initiated fires can cause severe devastation as in the Piper Alpha disaster in the North Sea where 167 lives were lost and the financial loss exceeded a billion pounds. The Deep Water Horizon explosion and fire resulted in the loss of 11 lives and the cost to BP is set to rise above £27bn. Loss of life in fires is commonplace and can be in large numbers, such as the 2013 Kiss nightclub fire in Santa Maria, Rio Grande do Sul, Brazil, killing at least 242 people echoing the 2003 Station club fire in Rhode Island where 100 people were killed. More recently the Grenfell Tower fire disaster highlighted the consequences of failing to properly consider fundamental fire behaviour principles.

Understanding the mechanisms and dynamics of fire development from a fundamental scientific level enables engineers to design safer systems, buildings and processes that protect life and property more effectively whilst allowing greater freedom in design.

Who should attend

Anybody who wishes/needs to gain a comprehensive, scientifically based analysis and engineering quantification tools, of fire development and consequence assessment in industrial and residential scenarios. This could include those involved in the design and operation of buildings and chemical plant (architects, civil engineers, chemical engineers), and in the design of protection systems (passive and active system developers, manufacturers, installers), those responsible for building and plant safety on a day to day basis, regulators and advisors (HSE, Fire Service, Home Office, Local Authorities, Building Control Offices, Consultants, Insurers) and fire-fighting professionals. Additionally, young researchers may find this course very useful.

What will you get out of this course?

On completion of this course, participants should be able to apply general combustion and engineering principles to fires, should know the parameters that influence flame spread and steady burning and should be able to quantify the burning rate in compartment fires, predict the rate of development of the fire, the onset of flashover, and appreciate the application of these concepts to fire protection design. They should also understand the factors influencing smoke toxicity and movement.

The participants will also be made aware of the predictive tools that are available and should become familiar with the application and use of such tools, through “hands-on” practice.

Course format

The course will follow a structured approach starting from the general fundamental principles of combustion flammability and heat transfer and leading the participant through to the more specific study of fire spread and fire development in compartments. Open fires such as pool and jet fires will also be covered. The principles of fire protection practice and technology will be discussed within the context of understanding the fire development mechanism and the response of structures to fires. The participant learning experience will be enhanced through worked examples and brief problems that the participants will be asked to attempt on their own or in groups (so please bring a calculator with you). On the last day of the course there will be the opportunity for some hands-on experience with predictive PC packages.

Accreditation

The Fire Dynamics and Modelling CPD course, Leeds, has been approved for 33.5 CPD hours in total by the Institution of Fire Engineers (IFE).

The Energy Institute has approved the University of Leeds – Faculty of Engineering as an Approved Training Provider.

MSc Option

This course is accredited by the University of Leeds to form part of an MSc Masters programme (full time or part time) in Fire and Explosion Engineering. Modules of this MSc may also be taken individually or as part of a coherent course to meet personal needs for Continuing Professional Development (CPD). For more information on the MSc please visit the website at http://engineering.leeds.ac.uk/fire
**MONDAY 23 OCTOBER 2017**

**Fundamental Processes**

- 08:30 Registration and coffee
- 09:00 Physical concepts  
  Dr Roth Phylaktou  
  University of Leeds
- 10:10 Coffee
- 10:30 Fuel and combustion processes and fundamentals  
  Dr Roth Phylaktou  
  University of Leeds
- 12:00 Limits of flammability  
  Dr Roth Phylaktou  
  University of Leeds
- 13:15 Lunch
- 14:00 Heat transfer: conduction and convection  
  Dr John Staggs  
  University of Leeds
- 15:10 Tea
- 15:30 Heat transfer: conduction and convection (continued)  
  Dr John Staggs  
  University of Leeds
- 16:30 End of day one
- 19:00 Course Dinner

**TUESDAY 24 OCTOBER 2017**

**Radiation, Ignition and Flame Spread**

- 08:45 Registration and coffee
- 09:00 Radiation from fires  
  Dr Roth Phylaktou  
  University of Leeds
- 10:20 Coffee
- 10:40 Radiation from fires (continued)
- 12:30 Lunch
  Dr Roth Phylaktou  
  University of Leeds
- 14:45 Tea
- 15:00 Spread of flame  
  Dr Roth Phylaktou  
  University of Leeds
- 16:15 Fire behaviour and modern buildings  
  Dr Danny Hopkin  
  Olsson Fire and Risk
- 17:00 End of day two

**WEDNESDAY 25 OCTOBER 2017**

**Pool Fires, Jet Fires and Cloud Fires**

- 08:45 Registration and coffee
- 09:00 Steady burning diffusion fires  
  Dr Roth Phylaktou  
  University of Leeds
- 10:00 Coffee
- 10:15 Pool fires in the open  
  Dr Roth Phylaktou  
  University of Leeds
- 11:15 Jet fires  
  Professor Derek Bradley  
  University of Leeds
- 12:00 Radiation from flames  
  Dr Roth Phylaktou  
  University of Leeds
- 14:05 Pool and jet fires, large scale tests  
  Rob Crewe, DNV-GL
- 15:00 Tea
- 15:15 Cloud fires  
  Peter Rew, ATKINS
- 16:10 Pool and jet fires in compartments  
  Professor Geoff Chamberlain,  
  Waverton Consultancy Ltd, previously  
  Shell Global Solutions (UK)
- 17:20 End of day three

**THURSDAY 26 OCTOBER 2017**

**Compartment Fires**

- 08:15 Registration and coffee
- 08:30 The growth period  
  Dr Roth Phylaktou  
  University of Leeds
- 10:00 Coffee
- 10:20 Flashover  
  Dr Roth Phylaktou  
  University of Leeds
- 12:00 Lunch
- 12:45 The post-flashover period and backdraughts  
  Dr Roth Phylaktou  
  University of Leeds
- 14:15 Fire performance of structures  
  Naomi Pimblett  
  BuroHappold Engineering
- 15:05 Tea
- 15:20 Smoke movement  
  Dr Roth Phylaktou  
  University of Leeds
- 16:05 Fire combustion products and toxicity as a function of ventilation conditions  
  Professor Gordon Andrews  
  University of Leeds
- 17:15 End of day four

**FRIDAY 27 OCTOBER 2017**

**Compartment Fire Modelling**

- 08:45 Registration and coffee
- 09:00 Overview of fire models  
  Dr Roth Phylaktou  
  University of Leeds
- 09:40 A zone model in detail – CFAST  
  Dr Roth Phylaktou  
  University of Leeds
- 10:45 Using CFD models  
  Jeremy Ockenden  
  BRE Global
- 12:00 Buffet Lunch
- 12:45 Transport to the University of Leeds
- 13:00 Hands on experience with a zone model  
  Peter Riley and  
  Dr Roth Phylaktou  
  University of Leeds
- 15:30 Return transport to  
  Weetwood Hall Hotel
- 15:45 Tea and issue of attendance certificates
- 16:00 End of day five and course

What our previous delegates say:

“"A very fast paced and jam packed background to fire dynamics and modelling, which gives any delegate a fantastic base of knowledge.”"  
AWE plc

“"Excellent course with a wide range of very interesting presentations and brilliant speakers.”"  
Mott MacDonald

“"Delivered exactly what it said – giving a comprehensive theoretical background for fire dynamics that will allow me to confirm and second guess modelling conclusions through first principles.”"  
Aecom Ltd

---

A full programme including detailed lecture descriptions can be viewed online at [www.engineering.leeds.ac.uk/short-courses](http://www.engineering.leeds.ac.uk/short-courses)

**Other fire engineering courses include:**

- Fire and Explosion Investigation  
  25 – 29 September 2017
- Fire Safety Design  
  27 November – 1 December 2017
- Gas, vapour and dust Explosion Hazards – protection, prediction and mitigation  
  March 2017, exact dates to be confirmed
Further information

Venue
The venue for the course will be Weetwood Hall Conference Centre and Hotel which offers first-class hotel facilities, a business centre and ample parking facilities. Weetwood Hall is an award-winning, flexible conference centre and hotel in the north of England.

Weetwood Hall Hotel is ideally situated 15 minutes north of the centre of Leeds in wooded grounds at the junction of the Otley Road and the outer ring road. It is just 15 minutes from Leeds Bradford International Airport and a short distance from the A1, M1, M606, M621 and M62 motorways.

Further details can be found at www.weetwood.co.uk

Course fees
The following course fees include the cost of tuition, course materials, lunches and light refreshments for the days of attendance:

| Full five days | £1595 |
| Any one day | £410 |

IFE members
Delegates who are a member of the Institution of Fire Engineers (IFE) will receive a 15% discount on the course fee. Please indicate when booking if you are a member, stating your IFE membership number.

IFE members fee £1355.75
IFE members one day fee £348.50

Accommodation
Bed and breakfast accommodation is available at the course venue, Weetwood Hall Conference Centre and Hotel.

We have negotiated the following special rates per night for our delegates:

| Friday – Sunday evening, bed and breakfast | £82 |
| Monday – Thursday evening, bed and breakfast | £86 |

To take advantage of these special rates please book by contacting the hotel direct on 0113 230 6000 (Stevie Standerline), E: stevie.standerline@weetwood.co.uk. Please quote “University of Leeds CPD Unit” and the course name when contacting Weetwood Hall to book accommodation.

Please note that accommodation bookings must be made two weeks before the course commences at the latest to qualify for the special rates and to guarantee room availability. Any accommodation requests after this date will be subject to availability and rates.

A list of alternative hotels is available on request. Delegates are responsible for their own evening meals except on Monday 23 October when the course dinner is included.

How to book
Booking for this course should be completed through our secure Online Store. To complete your booking please follow the instructions below:
1. Log on to our Online Store at: https://store.leeds.ac.uk
2. Select Conferences and Events in the left-hand navigation bar.
3. Select CPD Faculty of Engineering
4. Select the course or event for which you wish to register and click on “Book”.
5. If you are a new user, please follow the instructions to register. If you already have an account log in as instructed.
6. Complete the application process as directed by the booking system. You will receive an automatic confirmation email within 24 hours of your booking.

Course dinner
The course dinner will be held at a Leeds city centre restaurant and is included in the course fee. This will take place on Monday evening and transport from and to Weetwood Hall Hotel is provided. The dress code is smart casual. If you would like to attend please indicate when booking.

Accessibility
Please let us know if you have any specific requirements including any access or dietary requirements in relation to this course.

For online booking queries and for all other enquiries please contact:
CPD, Conference & Events Coordinator
CPD, Conference & Events Unit, Faculty of Engineering
School of Chemical and Process Engineering, 3.11 University of Leeds
LEEDS, LS2 9JT, UK.
T: +44 (0)113 343 2494/5746
E: cpd@engineering.leeds.ac.uk
W: www.engineering.leeds.ac.uk/short-courses
@LeedsUniCPD

Terms and conditions for booking
Payment in full should accompany your booking. The course fee is exempt from VAT. Fees must be paid in full no later than 15 working days before the course commences. Failure to pay may result in attendance being refused.

Registrations are accepted on the understanding that the printed programme is given in good faith but may have to be re-scheduled or the speakers changed for reasons outside our control. The University of Leeds reserves the right to cancel or postpone the course, in which case fees will be refunded in full. In the event of cancellation, the University will not be held liable for delegates travel or accommodation expenses.

Delegates will receive a full refund for cancellations made within 7 days of online booking, except where the booking has been made for an event commencing within the next 7 days. Where a delegate wishes to cancel a registration after this 7-day period, written cancellations received up to 15 working days before the course will be subject to an administrative charge of 30% of the total remittance. After this date the full fee is chargeable and no refunds will be made, this also applies for non-attendance but copies of the course documents will be sent. Substitutions may be made at any time.

If you are unable to complete your registration using the online booking system please contact the CPD, Conference & Events Unit to discuss alternative arrangements.