

Faculty of Engineering



Diesel Particulates and **NO_x Emissions (USA)**

**Monday 7 – Friday 11
November 2011**

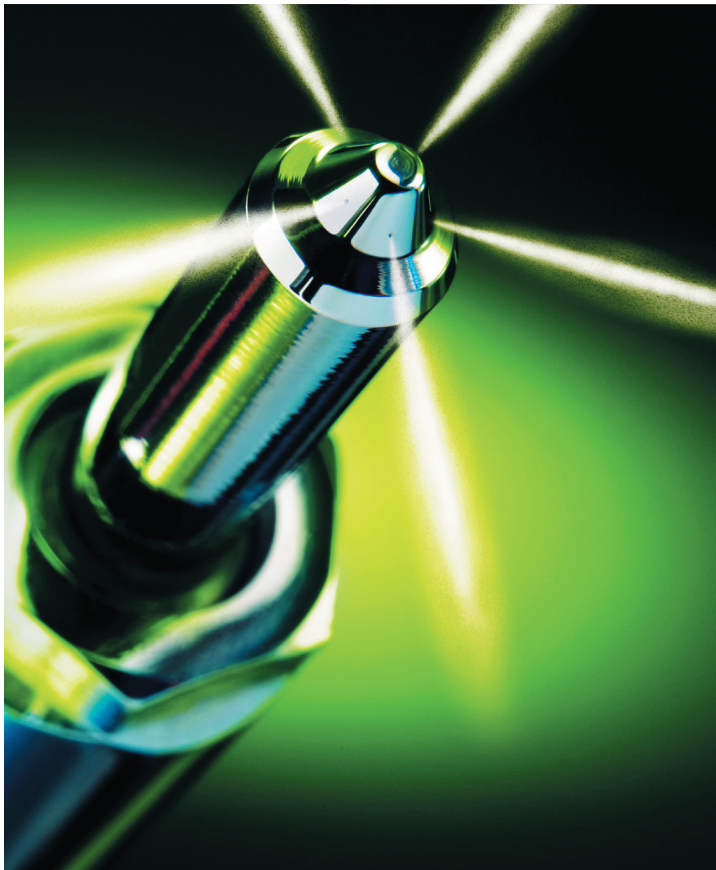
Venue: Walter P. Chrysler
Museum, Michigan, USA

Course Directors:
Professor Gordon Andrews
Energy & Resources
Research Institute
University of Leeds, UK

Professor David Kittelson
Centre for Diesel Research
University of Minnesota

**Fees Held at
2010 Rates**

Register Early -
Late Registration
Fee Applies from
26 August



Information about the course

DIESEL PARTICULATES & NO_x EMISSIONS USA

Monday 7 – Friday 11 November 2011

Background to the Course

By popular request, this unique Continuing Professional Development (CPD) short course will be held again in the USA. The UK course has been attended by engineers from all the European automotive and petroleum companies and previous delegates on the USA course include:

Arvin Meritor	Ethyl Corporation	Nissan Technical Centre Europe
AVL North America	Garrett	Oak Ridge National Lab
BP	General Motors	Parker Filtration
Castrol International	Horiba Instruments	Ricardo Inc
Caterpillar Inc	IAV Inc Automotive	Siemens Westinghouse
Chrysler LLC	ICT Inc	Thermo King
Corning Inc	John Deere Power Systems	US Army
Delphi Diesel Systems	Johnson Matthey	Volvo Car Corporation
Donaldson Company Ltd	Mercedes Benz Technology	Westcast Industries Inc.

This successful course is organised and administered by the University of Leeds, UK, and has run in the USA for automotive engineers since 2005. The course has been held in the UK for over 20 years, and is annually updated, drawing upon speakers and companies that have developed expertise in their field.

Course Directors

Professor Gordon Andrews

Professor of Combustion Engineering,
University of Leeds

Professor David Kittelson

Centre for Diesel Research,
University of Minnesota

Course Fee

The fee is \$2300 US Dollars per delegate for the full five days or \$565 for any one day and this includes the cost of tuition, comprehensive course notes and lunches and refreshments for the day(s) attendance.

Please see the “How to Book” section on the back page of the leaflet for information on how to book online.

Course Venue

The course will be Walter P. Chrysler Museum, One Chrysler Drive, Auburn Hills, Michigan, 48326-2778, USA. Directions to the venue will be included within the delegates Joining Instructions.

Accommodation

Delegates are responsible for their own evening meals and accommodation. A selection of hotels close to the venue will be provided within the Joining Instructions for delegates to book their own accommodation if required.

What our previous delegates say

“ I came with less than 3 weeks experience of the industry but the lectures were highly informative and I now have a great set of notes. Thanks.”

“ Great content, very relevant. A comprehensive summary about our industry’s development and challenges.”

“ An interesting and intense course that greatly improved my understanding of emissions in diesel engines.”

“ This course helped me understand future emissions requirements with a wealth of relevant reference information.”

Full course programme

This is a very intensive course covering the latest developments in incylinder and exhaust aftertreatment diesel particulates and NO_x control. Our aim is to give as complete and up to date coverage of the control of diesel particulates and NO_x emissions as possible. To receive a full programme, including detailed lecture descriptions please email us at

cpd@engineering.leeds.ac.uk

Monday 7 November 2011
(08.00 – 17.30)

DIESEL COMBUSTION AND EMISSIONS

- Diesel emissions – introduction to the environmental problems and legislation
- Diesel engine thermodynamic conditions and turbocharging
- Ignition delay
- The Nissan MK concept with long ignition delays to achieve premixed combustion
- CO emissions and control in diesel engines
- NO_x formation and control in diesel engines
- Use of EGR for NO_x control
- Engine exhaust particles in the atmosphere

Tuesday 8 November 2011
(08.00 – 18.00)

ENGINE DESIGN AND LUBE OIL INFLUENCES ON NO_x AND PARTICULATE EMISSIONS

- Diesel engine processes that influence particulate formation
- Instruments for particle size measurements
- Factors influencing carbon formation in diesel engines
- UHC, particulate fuel fraction and PAH emissions
- The role of lubricating oil in diesel particulate emissions
- The lubricant contribution to future low emission engine design
- Ultrafine and nanoparticle formation by engines

Wednesday 9 November 2011
(08.00 – 18.00)

INFLUENCE OF DIESEL FUELS AND ADDITIVES ON EMISSIONS

- Sources of variability in exhaust particle emission measurements
- Fuel property influences on diesel emissions
- Oxygenated Fuels
- Biodiesels
- Fuel borne catalysts for DPF regeneration
- Emulsified fuels and water injection for NO_x and particulate reduction
- Refining, Distribution and Formulating Clean Diesel Fuel for Emission Reduction
- Homogeneous charge and partially premixed diesel engines for low NO_x and low soot emissions

Thursday 10 November 2011
(08.00 – 17.30)

PARTICULATE AND CATALYTIC CONTROL OF EMISSIONS

- Oxidation Catalysts – Roles in diesel emissions control
- Diesel Particle Traps – overview
- Diesel Particulate Filter Systems with oxidation catalyst
- Transient gas and particulate emissions measurements from diesel passenger cars
- Diesel NO_x Control Systems – NO_x-Trapping and Ammonia SCR Systems
- SNCR and NH₃ mixing and control for SCR

Friday 11 November 2011
(08.00 – 15.45)

DIESEL FUEL INJECTION AND ENGINE DESIGN TRENDS FOR LOW EMISSIONS

- Unit injection and common rail fuel injection systems
- Modern turbocharger systems
- Future heavy duty emissions control technology
- Cold start and diesel filter light off options
- Engine system strategies to meet future on and off-highway US emission legislation

2011 Industrial Guest speakers include:

Afton Chemical • **John Deere Power Systems** • **Cambustion** • **Cummins Turbo Technologies** • **Delphi Diesel Systems** • **Corning Inc** • **Innospec Inc**

Course fees

The following course fees include the cost of tuition, course notes, lunches and light refreshments for the day(s) of attendance:

- \$2300 Full five days**
- \$565 Any one day**
- \$170 Late Registration Fee (applies after 26 August 2011)**

Special requirements

Potential delegates who have any special requirements should contact the course co-ordinator as soon as possible.

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.

For online booking queries and for all other enquiries

If you are experiencing problems with booking online or have any queries about the course please contact:

Rachael Lawson, CPD Course and Events Co-ordinator,
CPD Unit, Faculty of Engineering,
c/o School of Civil Engineering,
Room 209 University of Leeds,
LEEDS, LS2 9JT, UK.

T: + 44 (0) 113 343 8104

F: + 44 (0) 113 343 2511

E: cpd@engineering.leeds.ac.uk

W: www.engineering.leeds.ac.uk/short-courses/

Potential delegates who have any special requirements should contact the above as soon as possible.

Terms and conditions for online bookings

Payment in full should accompany your online booking.

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 commences will be subject to an administrative charge of 20% 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 Unit to discuss alternative arrangements.