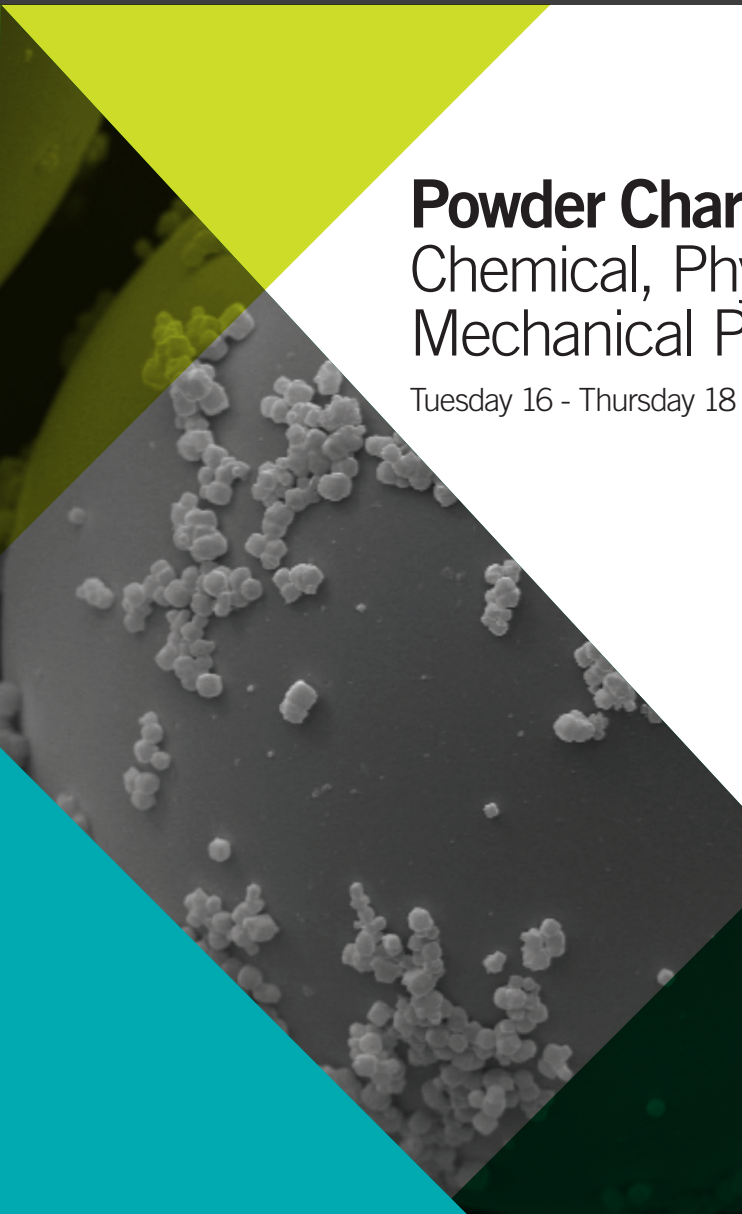
Faculty of Engineering

UNIVERSITY OF LEEDS

Powder Characterisation: Chemical, Physical and Mechanical Properties

Tuesday 16 - Thursday 18 May 2017



Powder Characterisation:
Chemical, Physical and Mechanical Properties

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Course directors

Professor Mojtaba Ghadiri and Dr Vincenzino Vivacqua
Institute of Particle Science and Engineering
University of Leeds.

Course aims

This short course will outline the principles and methods for characterising the chemical, physical and mechanical properties of powders at length scales ranging from molecular level to single particles and to bulk levels. Sample preparation and the state-of-the-art techniques for particle characterisation will be detailed.

The course is given by over ten presenters with internationally-leading expertise in their own speciality fields. The outcome of the course should enable the participants to choose what and how to characterise the powder and suspension properties and to diagnose particular process and product issues of interest.

Intended audience

The course is intended for scientists, engineers and technologists wishing to gain a better understanding of powder characteristics to enable them to address powder handling, processing and manufacturing issues from a fundamental base.

> “Excellent course covering all aspects of working with powders”
> **Teva Pharmaceuticals**

> “Ideal for anyone looking for a broad overview of the current best approaches to powder characterisation and a deeper dive into powder mechanics fundamentals”
> **Proctor & Gamble**

2017 SPEAKERS

- Dr David Berry, Durham University
- Dr Colin Hare, University of Surrey
- Professor Norman Harmby, University of Bradford
- Dr Jerry Heng, Imperial College
- Dr Csaba Sinka, University of Leicester
- Dr Tina Bonakdar, University of Leeds
- Professor Mojtaba Ghadiri, University of Leeds
- Dr David Harbottle, University of Leeds
- Dr Mehrdad Pasha, University of Leeds
- Dr Umair Zafar, University of Leeds

Programme

Tuesday 16 May 2017

Characterisation of Physical Properties of Particles

Sampling and sample preparation for particle characterisation
- Origins of problems in particle property analysis
- Sampling from particulate systems
- Sample preparation

Particle size analysis
- Principles of size analysis
- State-of-the-art instruments for particle sizing

Particle shape and structure characterisation
- Shape and shape description
- Surface morphology and structure
- Application to density determination

Suspension rheology
- Introduction to the principles of suspension rheology
- Particle structuring in suspensions
- Measurement of suspension rheology

Bulk flow of powders
- Cohesive and free-flowing powders
- Segregation and structure
- Application of characteristics to process design

Course Dinner – Leeds

Wednesday 17 May 2017

Characterisation of Mechanical Properties of Particles

Mechanical properties of powders
- Introduction to mechanical properties of powder
- Characterisation of deformation and breakage of particles
- Characterisation by nano-indentation
- Particle breakage under brittle and semi-brittle failure modes
- Impact and side crushing of single particles
- Bulk compression and crushing

Bulk characterisation of powders
- Shear cells and powder rheometry
- Frictional properties
- Consolidation and unconfined yield stress

Electrostatics in powder systems
- Fundamentals of tribo-electrification of powders
- Measurements of tribo-electrification of powders
- Industrial applications of electrostatics in powder systems

Instrument demonstrations

Thursday 18 May 2017

Characterisation of Chemical Properties of Particles

Adhesion
- Principles
- Measurement techniques
- State-of-art in the field

Solubility and dissolution of particles
- Principles
- Applications

Tabletting and compaction of powders
- Fundamentals of tabletting and compaction of powders
- Industrial use of tabletting and compaction

Determination of Powder Surface Energy and Surface Chemistry
- Principles
- Applications to powders

Further information

Venue

The course venue will be the Faculty of Engineering at the University of Leeds. Please note, car parking for visitors is unavailable at the University. The nearest public car park is Woodhouse Lane (multi storey) at LS1 3HQ.

Course fees

The course is designed on a single topic per day, enabling delegates to attend the full course or single days most relevant to them. The following course fees include the cost of tuition, course materials, lunches and light refreshments for the day(s) of attendance:

£1200 Full course
£400 Any one day

Discounted fees apply to postgraduate students.

Accommodation

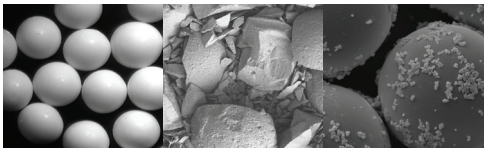
Delegates are responsible for their own accommodation (if required). A list of hotels close to the University will be sent out within the delegate joining instructions.

Course dinner

The course dinner will be held at a Leeds restaurant and is included in the course fee. This will take place on Tuesday evening and the dress code is smart casual.

Accessibility

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



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 please contact:

Jenny Carter
CPD Conference and Events Co-ordinator
CPD, Conference and Events Unit
Engineering Research & Innovation Service
Faculty of Engineering
c/o School of Civil Engineering, Room G.04
University of Leeds
Leeds LS2 9JT
UK
T: +44 (0)113 343 0893
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 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, Conference & Events Unit to discuss alternative arrangements.