Powder Characterisation: Chemical, Physical and Mechanical Properties

Tuesday 12 – Thursday 14 May 2020
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Course directors
Professor Mojtaba Ghadiri and Dr Wei Pin Goh
School of Chemical and Process Engineering
University of Leeds

About the course
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.

Who should attend
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.

“Expert presentations, well balanced material and very good organisation”
Pfizer

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

Programme

Tuesday 12 May 2020
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

Networking drinks reception and poster session

Wednesday 13 May 2020
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

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

Course dinner

Thursday 14 May 2020
Characterisation of Chemical Properties of Particles

Determination of powder surface energy and surface chemistry
- Principles
- Applications to powders

Tableting and compaction of powders
- Fundamentals of tableting and compaction of powders
- Industrial use of tableting and compaction

Solubility and dissolution of particles
- Principles
- Applications

The course closes at 14:30 on day three

2020 Speakers
- Dr David Berry, Centre for Process Innovation (CPI)
- Dr Rammile Ettelaie, University of Bradford
- Professor Mojtaba Ghadiri, University of Leeds
- Professor Norman Harnby, University of Bradford
- Professor Mojtaba Ghadiri, University of Leeds
- Dr Jerry Heng, Imperial College London
- Dr Sadegh Nadimi, Newcastle University
- Dr Mehrdad Pasha, University of Leeds
- Dr David Scott, Advanced Particle Sensors LLC, USA
- Dr Csaba Sinka, University of Leicester
- Dr Umair Zafar, Novartis, Switzerland

Day two of the course includes practical demonstrations of powder characterisation in the School of Chemical and Process Engineering laboratories.

View the full programme and register online at: https://eps.leeds.ac.uk/ short-courses
Further information

Venue
The course will be held at the Faculty of Engineering and Physical Sciences, University of Leeds, Leeds, LS2 9JT.
The University campus is a 20 minute walk from Leeds City train station. 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 you to attend the full course or single days most relevant to you. 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
You’re responsible for your own accommodation if required. A list of hotels close to the University will be sent out within the delegate joining instructions.

Course dinner
All delegates are invited to the course dinner on Wednesday 13 May at no extra charge. This is an excellent networking opportunity and relaxing end to day two of the course, we hope you can join us. 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
You can book your place using our Online Store using debit or credit card. Please follow the guidance below on how to complete your booking:

1. Visit our Online Store at: https://store.leeds.ac.uk
2. Select Conferences and Events in the left-hand navigation bar and ‘CPD Faculty of Engineering and Physical Sciences’
3. Select the course and complete your booking details

If you are a new user, please follow the instructions to register. If you already have an account you can log in as instructed.

You will receive a confirmation email within 24 hours of your booking.

Our privacy notice tells you what we do with your personal information when you book one of our courses: https://eps.leeds.ac.uk/privacy

Contact and enquiries to:
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CPD, Conference and Events Unit,
University of Leeds

Terms and conditions for booking
Payment by debit/credit card: Payment should be made at the time of booking via the Online Store.

Payment via purchase order and invoice: A purchase order document should accompany your booking form. Our standard terms of payment are 30 days from date of invoice, however payment must be made prior to attendance. Attendance may be refused if payment has not been received.

Changes made by the University of Leeds: The course programme 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 a 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.

Where a delegate cancels a registration: For cancellations made within seven days of booking: a full refund is payable unless the course starts within the next seven days, in which case the full fee is payable and no refunds will be made.

For cancellations made after seven days of booking: Written cancellations received up to 15 working days before the course will be subject to an administrative charge of 20% of the total fee. Within 15 working days of the course the full fee is payable and no refunds will be made.

For non-attendance: The full fee is payable and no refunds will be made but copies of the course materials will be sent to the registered delegate. Substitutions may be made at any time.

Data/Privacy: Your right to privacy is important to us. We will only use your information to provide information on our CPD courses and relevant events. We will not pass your details on to any other organisations. The ways in which your personal data may be used when you provide it to us are defined in our Privacy Notice at https://eps.leeds.ac.uk/privacy.

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