

Faculty of Engineering
and Physical Sciences



UNIVERSITY OF LEEDS

Microencapsulation

Tuesday 10 – Thursday 12 September 2024



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About the course

This course covers the basic science and engineering of microencapsulation across a wide range of applications including the important stages of emulsification control, stability and release property control. Whilst the majority of the course involves emulsions, multiple emulsions and particle coating, we also provide a comprehensive description of the range of characterisation tools and their applicability. The emphasis is on understanding the fundamental behaviour of the interactions of the various components in such complex systems. This should provide the basis for a rational approach to formulating and producing micro encapsulates to meet a range of needs.

The course offers a programme of academic and industry cooperation taking delegates from the basic science through to manufactured products. Recent updates to the course mean that we are now also focusing on alternatives to historical microencapsulation systems in response to the recent microplastics regulations, which is driving the industry towards developing biodegradable alternatives. This year's course will feature sessions to better understand the regulation environment, to specifically describe alternative microcapsule shell materials that are more environmentally friendly and some discussion around biodegradability testing.

What our previous delegates say:

"It's an excellent course that not only covers the basics of microencapsulation but also covers some industrial applications with all its advantages and disadvantages" **Isabel Sousa, University of Aveiro**

"The course was an excellent opportunity both to review/get exposed to the primers of microencapsulation whilst also allowed discussions on advanced and more specific topics." **Julio Uribe-Padilla, Eurofragrance S.L.U**

"It was the best microencapsulation course I attended and truly recommend to all that works or want to work in this field." **Ricardo Costa, Devan Chemicals**

Course aims

On completion of this short course, you will have an understanding of:

- developing a rational approach to formulate or modify emulsions for optimal processing behaviour and use available laws and scaling relations to predict behaviour
- the various methods to turning emulsions into encapsulates, including the process conditions that impact their final properties and behaviour
- selecting characterisation devices and defining measurement procedures for a specific application
- evaluating and interpreting experimental data
- biodegradability and alternatives to microplastics

Who should attend

This course is designed for scientists and engineers in the chemical, petroleum, polymers, coatings, inks, food, pharmaceuticals, cosmetics or general chemical industries with responsibility for R&D projects, process engineering, manufacturing or product formulation involving incorporating microencapsulates into formulated products.

Course Director

Dr Olivier Cayre, University of Leeds

View the full programme and book your place online at <https://tinyurl.com/MicroencapsulationCourse2024>

Programme

10 September 2024

Basic science and key points around microencapsulation – what you need to know to get started

09.30 Registration and coffee

10.00 **Introduction to the course**

10.10 **Map to guide you through the course: microencapsulation methods vs product requirements**
Dr Olivier Cayre, University of Leeds

10.50 **Important properties of system to encapsulate (Hansen solubility parameter)**
Professor Steven Abbott, TCNF & University of Leeds

11.30 Coffee

11.50 **Important Capsule Properties**
Dr Olivier Cayre, University of Leeds

Spray drying

12.30 **Introduction to spray drying for encapsulation**
Professor Andrew Bayly, University of Leeds

13.10 Lunch

14.00 **Droplets and sprays in encapsulation: background in forming droplets from nozzles and common process units**
Speaker to be confirmed

14.50 **Demonstration session 1**

- **D1 – Release Rates in Alginate Systems**
UoL demonstrator TBC
- **D2 – Spray drying**
Professor Andrew Bayly, University of Leeds
- **D3 – Metal shell capsules preparation – achieving retention and triggered release of small volatile actives**
UoL demonstrator TBC
- **D4 – Membrane emulsification: Monodisperse droplet production**
Faye Hearfield, Micropore

16.05 Tea

Coating of particles

16.25 **Particle functionalization by core-shell or matrix-encapsulation in fluidized beds from an industrial perspective**
Arne Teiwes, Process Technology Feed, Food, Fine Chemicals / New Technologies, Technology Development, Glatt Ingenieurtechnik GmbH

16.55 **Q&A Session**

17.05 End of day one

19.00 Course dinner

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Coating of particles continued

08.45 Coffee

09.00 **Industry presentation on coating of solid particles using fluid beds**
Dr Tom Wyrwat, Amandus Kahl

09.40 **Single step and solvent-free plasma functionalization and encapsulation of particles**
Dr Rik Verschuere, PartiX

10.20 Coffee

Barriers and opportunities

10.40 **How to decide on an affordable microencapsulation method – economics behind encapsulation**
Dr Olivier Cayre, University of Leeds

11.20 **The regulatory landscape – what does the future hold and will it impact innovation?**
Clare Walker, Head of Global Regulations and Product Safety, Holiferm

12.00 Lunch

13.10 **Industry perspective: EU regulations and impact on industry with regards environmental impact and micro plastics with respect to formulated products**
Andre Barros, Procter & Gamble

Emulsion-based methods

14.00 **Focus on emulsion-based encapsulation methods: what the rest of the course contains**
Dr Olivier Cayre, University of Leeds

14.10 **Emulsion theory, importance of miscibility/cLogP, how useful is HLB of surfactants, Pickering emulsions/colloidosomes**
Professor Brent Murray, University of Leeds

14.50 Tea

15.10 **Demonstration session 2**

- **D2 – Spray drying**
Professor Andrew Bayly, University of Leeds

- **D4 – Membrane emulsification: Monodisperse droplet production**
Faye Hearfield, Micropore

- **D5 – Adhesion of perfume microcapsules to fabrics via a bespoke microfluidic device**
Dan Baiocco, University of Birmingham

- **D6 – Preparation of silica microbeads**
Mohammed Al-Sharabi, University of Cambridge

16.25 **Making capsules by destabilisation of shell particles**
Professor Alex Routh, University of Cambridge

16.55 **Interfaces into shells: past and current encapsulation and release methods**
Dr Olivier Cayre, University of Leeds

17.35 **Q&A Session**

17.45 End of day two

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Emulsion-based methods: Turning emulsions into core-shell microcapsules

08.45 Coffee

09.00 **Controlling fragrance retention in microcapsules for Consumer Products**
Dr Ian Harrison, Givaudan

09.30 **Membrane Emulsification: Applications in encapsulation/coacervation and biodegradable polymers**
David Palmer, Micropore

10.10 **Biodegradable encapsulates**
James Ward Taylor, Xampla

10.40 Coffee

11.00 **Alternatives to polymer shells and important features of release characterisation**
Dr Olivier Cayre, University of Leeds

11.40 **Demonstration session 3**

- **D1 – Release Rates in Alginate Systems**
UoL demonstrator TBC

- **D3 – Metal shell capsules preparation – achieving retention and triggered release of small volatile actives**
UoL demonstrator TBC

- **D5 – Adhesion of perfume microcapsules to fabrics via a bespoke microfluidic device**
Dan Baiocco, University of Birmingham

- **D6 – Preparation of silica microbeads**
Mohammed Al-Sharabi, University of Cambridge

12.55 Lunch

13.40 **Key properties and evaluation**
Dr Nicole Hondow, University of Leeds

14.10 **Evaluating mechanical properties and release rates – techniques, challenges and watch outs**
Professor Zhibing Zhang, University of Birmingham

14.40 **Q&A Session / Trouble shooting forum**
Optional lab tour

15.25 End of day three and course

Please note, although we remain devoted to the programme specified, we reserve the right to vary the programme in detail if required to do so by factors beyond our control.

Further information

Course Fees

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

£1135 Tuesday 10 – Thursday 12 September 2024

Venue

The course venue will be within the Faculty of Engineering and Physical Sciences at the University of Leeds. 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.

Accommodation

Delegates are responsible for their own accommodation and a list of hotels close to the University will be sent out with the joining instructions.



How to Book

Please book your place for this course through our secure Online Store, using debit or credit card, following the instructions below:

1. Visit our Online Store at: <http://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 relevant course, click on 'Book Event' and complete your booking details

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

Get in touch


Katie McCarthy – Course Coordinator
CPD, Conference and Events Unit
Faculty of Engineering and Physical Sciences
University of Leeds

T: +44 (0)113 343 5746

E: cpd@engineering.leeds.ac.uk

W: <https://eps.leeds.ac.uk/short-courses>

 [CPD, Conference and Events Unit,
University of Leeds](#)

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Terms and conditions for booking

Payment

Payment by debit/credit card should be made at the time of booking via the Online Store. If for exceptional reasons you are unable to book and pay online a purchase order document will be required to support a manual booking process. Our standard payment terms 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. Appropriate course materials will be sent to the registered delegate.

In the event of cancellation, the University will not be held liable for or refund any incurred travel or accommodation expenses. 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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University of Leeds
Leeds, United Kingdom
LS2 9JT
0113 243 1751
www.leeds.ac.uk