

THE UNIVERSITY OF MANCHESTER
Programme Unit Specification

7. TEACHING SCHEDULE

Location: Room 1.29, School of Chemical and Process Engineering, University of Leeds (corner of Woodhouse Lane and Clarendon Road).

***For registration please arrive by 9:15 am on Monday 2nd March to room 1.29 in the School of Chemical and Process Engineering.**

Date	Time	Lecturer	
02/03/2020	9:30-17:00	Dr. David Harbottle	<i>Introduction to the nuclear fuel cycle and particle science.</i>
03/03/2020	9:30-17:00	Dr. Ali Hassanpour	<i>Particle processing and fuel manufacturing.</i>
04/03/2020	9:30-17:00	Dr. Tim Hunter	<i>Effluent treatment and legacy wastes.</i>
05/03/2020	9:30-17:00	Laboratory Practical + Revision	<i>Pipeline transport velocity and impinging jet.</i>
06/03/2020	9:30-14:00	All	<i>Summary and in-class test.</i>

Dr David Harbottle: The course begins with an introduction to the nuclear fuel cycle highlighting the reoccurrence of particles and particle challenges throughout, starting from uranium mining and extraction through to legacy waste and long-term waste storage. Concepts of particle science will be explained and the practical outcomes of controlling particle interactions to manipulate stability and flow properties of particle dispersions demonstrated. Students will derive settling equations from first principles to explain how the performance of settling systems such as mixer-settler, settling corral, flocculation tank, etc. are governed by the basic physical and chemical properties of the dispersion.

Dr Tim Hunter: Students will learn about the importance of particle science in relation to nuclear effluent treatment and legacy wastes, including example systems and problems from the UK, US and France. Students will also undertake a tutorial utilizing the principles of waste particle characterisation to design a nuclear waste clarifier system, similar to operational units on the Sellafield site in the UK.

Dr Ali Hassanpour: The lecture will cover fundamentals of powder processing relevant to the fuel manufacturing such as particle characterisation, powder mixing and segregation, particle size reduction, particle size enlargement by agglomeration and compaction. Students will also undertake a tutorial for further enhancement of their understanding of the powder processing steps in fuel manufacturing.