

CHARACTERISATION OF

# *Advanced Materials*



MONDAY 3 DECEMBER - FRIDAY 7 DECEMBER 2018

## WHO SHOULD ATTEND?

Those wanting an in-depth knowledge of Characterisation of Advanced Materials. It will be suitable for graduates in science or engineering who are entering the field and for technical staff wanting an appreciation of the background science.

## THE COURSE

The aim of this five-day course is to introduce the principles of the most widely-used materials characterisation methods based on microscopy, chemical, physical and structural analysis and thermal techniques. Consideration will also be given to the analysis of particulate materials and coatings.

The basic principles used for the physical characterisation of materials will be outlined; microscopy by light, electrons and scanned probes will be introduced; and the readily available bulk characterisation methods such as diffraction, X-ray analysis and vibrational spectroscopies will be described. Surface analysis by electron and ion spectroscopies will also form an important part of the course. Particular emphasis will be paid to the use of a variety of methods in multi-technique approaches for the characterisation of advanced materials.

The course will be staffed by lecturers with considerable experience in materials characterisation. The programme will comprise lectures, laboratory demonstrations and exercise classes with the course tutors.

## OUTLINE OF THE COURSE

- Thermal Analysis
- X-Ray Diffraction
- Electron Back Scatter Diffraction
- Infra Red Spectroscopy
- Light Microscopy
- Image Acquisition Analysis and Processing
- Electron Interactions
- Scanning Electron Microscopy
- The use of Focused Ion Beams (FIB)
- X-ray Analysis in Electron Microscopy
- Transmission Electron Microscopy: Imaging and Diffraction
- Scanning Probe Microscopies
- Electron Energy Loss Analysis in the TEM/STEM
- Electron Backscatter Diffraction
- X-Ray Photoelectron Spectroscopy
- Auger Electron Spectroscopy and Microscopy
- Secondary Ion Mass Spectrometry
- Ion beam analysis: RBS and PIXE

## KEY POINTS

For course calendar and online registration: [surrey.ac.uk/departments/mechanical-engineering-sciences/short-courses](https://surrey.ac.uk/departments/mechanical-engineering-sciences/short-courses)

If you have a question please call: **+44 (0)1483 686122**

Courses run for one week from Monday morning to Friday afternoon.

Delegates may request a list of local accommodation

## MSC IN ADVANCED MATERIALS

This short course is offered as a module in our part-time or full-time Modular MSc Programme in Advanced Materials. Further details of our programme can be found on our web pages:

[surrey.ac.uk/postgraduate/advanced-materials-msc-2018](https://surrey.ac.uk/postgraduate/advanced-materials-msc-2018)

## COURSE DIRECTOR

The Course Director and Co-Director are Professor John Watts and Dr Mark Whiting.

Dr Mark Whiting

[surrey.ac.uk/people/mark-j-whiting](https://surrey.ac.uk/people/mark-j-whiting)

Professor Robert Dorey

[surrey.ac.uk/people/robert-dorey](https://surrey.ac.uk/people/robert-dorey)

They will be joined by colleagues from across the University of Surrey's nanomaterials activity.

These short courses have been approved for "Professional Development" by IOM3 (Institute of Materials, Minerals and Mining).



## CENTRE FOR ENGINEERING MATERIALS

The course is delivered from the Centre for Engineering Materials, home to the biggest concentration of materials researchers at Surrey with interests spanning all materials groups from the nanoscale through to macroscopic engineering structures. Across the University there are over 50 academics, residing in six engineering/ physical science departments, for whom materials is a primary research interest:

[surrey.ac.uk/centre-engineering-materials](https://surrey.ac.uk/centre-engineering-materials)

The research, which is recognised as being internationally excellent, spans topics as diverse as the production of graphene through to the mechanical testing of metre long sections of Victorian water mains. Much of the work is underpinned by the University's world-leading capability in characterisation, which comprises both facilities and expertise. Further, Surrey has a history of working in partnership with industry and a proven track record in delivering academically acclaimed and industrially relevant postgraduate courses.

The University is also home to the thriving, much-admired Engineering and Physical Sciences Research Council (EPSRC) Centre for Doctoral Training in Micro and NanoMaterials and Technologies which was established in 2009, and subsequently refunded in 2014, with awards amounting to over £9 million from the EPSRC and sponsorship of engineering doctorate students from over forty companies, to date: [surrey.ac.uk/minmat](https://surrey.ac.uk/minmat)



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The Institute of Materials,  
Minerals and Mining

**ACCREDITED PROGRAMME**

Characterisation of Advanced Materials is also part of the  
Advanced Materials MSc programme which is accredited by IOM3

We've made all reasonable efforts to ensure that the information in this publication was correct at the time of going to print in September 2018, but we can't accept any liability for any inaccuracies in the information published, and the information might change from time to time without notice. For the latest and most up-to-date information, please visit our website at [surrey.ac.uk](http://surrey.ac.uk)