

Advanced Process Monitoring in Composites Manufacture

17 April 2012 - 19 April 2012

Why Cranfield University

Wholly postgraduate with an international community and a truly global reputation, Cranfield University is recognised globally for its multidisciplinary approach to teaching and research. With a top two ranking for staff to student ratios in the UK, an excellent rating for teaching, and exceptional facilities, Cranfield makes an ideal destination for advancing careers. All courses are designed to meet the training needs of industry and have a strong input from experts in their sector. Our graduates are highly sought after by leading organisations, internationally.

Location

Our central location provides easy access from the M1, excellent main line rail service as well as proximity to key international airports. The campus has ample free car parking.

How to register

To request a place on this course, please complete the online Registration Form.

If you have any queries please contact:

Academic Operations Unit
Cranfield University
Cranfield
Bedfordshire
MK43 0AL
United Kingdom

T: +44 (0) 1234 754176

E: shortcourse@cranfield.ac.uk

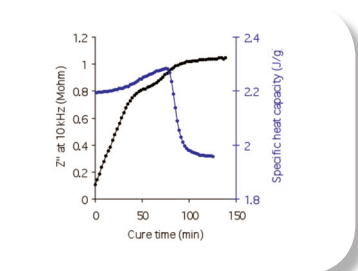
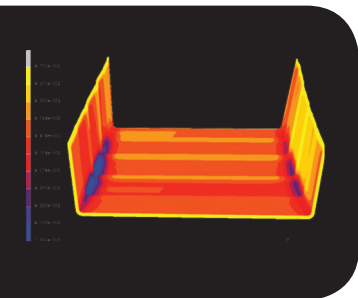
F: +44 (0) 1234 751206

Please be aware that short courses/CPD are subject to:
Booking Conditions

You can download an application form by visiting the web address below

www.cranfield.ac.uk/sas/advancedprocessmonitoring





Course fee:

- £870 - Standard. 20% discount for Cranfield alumni, 10% discount for colleagues of alumni
- £825 - Professional/trade association discount
- £795 - Multiple bookings*

*Minimum of five delegates.

Accommodation fee:

Accommodation is not included in the price.

The course

This 3 day specialist intensive course provides in-depth exposure to modern monitoring technologies as a means of assessing and tackling realistic industrial issues connected with the processing of fibrous thermosetting composites. The focus is on dielectric and optical fibre sensor monitoring of cure and flow phenomena, with an overview of associated analysis methodologies and tools.

There is a significant lab-based demonstration section to complement the lecture content as well as a tutorial session focusing on analysis tools and methodologies.

The course will start at 11am of Day 1 and finish by 4pm on Day 3 and will involve some evening sessions.

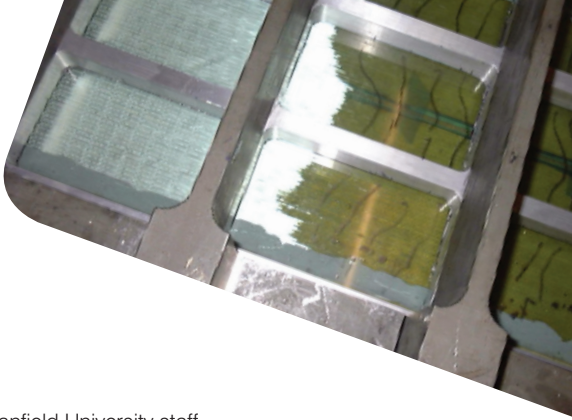
Who should attend

The course is aimed at graduate practitioners who are involved in the manufacturing of composite structures, materials engineers and scientists who participate in composites process selection and design, PhD students with relevant research topics will also benefit.

Learning outcomes

On successful completion of this course the delegates will be able to:

- Use and develop cure kinetics models
- Design experimental campaigns for the characterisation of thermosets
- Understand and analyse dielectric monitoring signals
- Evaluate the applicability of different monitoring methodologies to specific components and processes
- Appreciate the links between simulation and monitoring of composites manufacturing



Course overview

Speakers:

The course content will be delivered mainly by Cranfield University staff (Dr Alex Skordos, Professor Ivana Partridge, Dr Stephen James, and Dr David Ayre) with contributions from leading academics from our EPSRC Centre in Innovative Manufacturing in Composites (Professor Andrew Long (University of Nottingham) and Professor Kevin Potter (University of Bristol)) and industry experts (Dr Tomasz Garstka (LMAT), Dr Mihalís Kazilas (TWI) and Dr George Maistros (Advise Deta)).

• Thermosetting resins

- Industrial thermosetting systems (Professor Ivana Partridge)
- Physics of cure (Professor Ivana Partridge)

• Material behaviour

- Cure kinetics (Dr Alex Skordos)
- Viscosity and glass transition temperature development (Dr Alex Skordos)
- Cure and rheological characterisation (Dr Alex Skordos)
- Demonstration of Differential Scanning Calorimetry and Rheometry (Dr David Ayre)
- Tutorial on cure kinetics modelling (Dr Alex Skordos)

• Dielectric cure monitoring

- Cure monitoring using dielectrics/impedance spectroscopy (Professor Ivana Partridge)
- Flow monitoring using dielectric and electrical sensors (Dr Alex Skordos)
- Dielectric cure monitoring demonstration (Dr George Maistros)
- Signal analysis for dielectric cure monitoring (Dr Alex Skordos)

• Fibre optic monitoring

- Flow monitoring using fibre optic sensors (Dr Stephen James)
- Cure monitoring using fibre optic sensors (Dr Stephen James)
- Strain monitoring using fibre optic sensors (Dr Stephen James)
- Fibre optic monitoring demonstration (Dr Edmond Chehura)

• Applications and extension to component level

- Industrial applications of monitoring (Dr Mihalís Kazilas)
- Defects in composites manufacture (Professor Kevin Potter)
- Process modelling: flow (Professor Andrew Long)
- Process modelling: cure residual stress development (Dr Tomasz Garstka)