



Cranfield
University

Continuing
Professional
Development

**Composites
Integration Repair
and Joining**

The globally growing market for composites and their increasing widespread use in critical structures (aerospace, automotive, energy, marine) has created an urgent need for reliable integration, joining and repairs of composite structures.

This is of particular interest to the aerospace sector which has more than a 40% share of the global composites market, and especially for composite aircraft's maintenance, repair and overhaul (MRO). However, development of the underlying knowledge is not keeping pace with this demand.

Alongside their well-known advantageous properties, their poor structural integrity in response to dynamic and impact events is still a major concern, with the challenge of detecting invisible damage that occurs in such events. In extreme circumstances, this could result in catastrophic structural failure in-service if not detected and repaired.

This course will provide knowledge-based industry-oriented sessions on assembly, joining and repair of high performance composite structures with contributions from academics, and distinguished speakers from industry and regulatory sectors.

Course objectives

The course delegates will:

- Experience intense knowledge-based industrial oriented sessions on composites integration, repair and joining with contributions from academics, composite manufacturers, MRO's and regulatory sectors.
- Appreciate a variety of integration, repair and joining procedures in composites structures from fastening to thermoset adhesive bonding and thermoplastic welding.
- Understand deterioration mechanisms occurring in processing and assembly of composite materials and structures.
- Learn about composite repair certifications.

Course Director

Dr Hamed Yazdani Nezhad
Enhanced Composites and Structures
Centre

Speakers

The course is presented by Cranfield University staff and external industry experts who all have considerable relevant experience.

Fees

£1,200 (concessions available)

Accommodation

Accommodation is not included and must be booked separately.

Who should attend?

This course is suitable for: aircraft/aerospace engineers, airlines' maintenance, repair and overhaul (MRO) delegates, automotive/racing car engineers, marine engineers, renewable energy engineers (e.g. wind energy), pressure vessels, piping and oil & gas engineers, civil and structural engineers, military and naval engineering staff, composite and materials engineers, mechanical engineers, research engineers, stressing and design engineers, certification engineers and regulators, accident investigation staff and design and technical management personnel.

Course delivery

This four-day intensive course will be delivered by lectures, practical sessions, laboratory, airport and aircraft visits and exercises, group sessions, NDI exercises, composite impact and bonding investigations. All teaching material will be provided in advance.

Core content

The following contents will be covered:

- Introduction to composite structural integrity.
- Best practices in bonding, bolting and assembly approaches.
- Process-induced defects in composite fastening and bonding.
- Mechanical fastening options for carbon fibre composites- some selection guidance.
- Adhesive bond damage tolerance and failure assessment.
- Tailored composite bonded repair.
- Self-healing bonding applications.
- Aerospace composite repair - regulatory perspective.
- Automated machining and surface preparation for composite repair.
- Thermoplastic welding.
- Laboratory exercise on composite impact damage, NDI and bonded repair.
- Visit composite manufacturing and NDI facilities.
- Visit to Cranfield airport and carry out a Boeing737 incident/repair investigation.

To book now, contact:

T: +44 (0)1793 754189 E: professionaldevelopment@cranfield.ac.uk
www.cranfield.ac.uk/cirj

Location



How to find us

Cranfield University is located about halfway between London and Birmingham, and on the outskirts of Milton Keynes. London Luton, Stanstead and Heathrow airports are 30, 90 and 90 minutes away respectively by car, offering superb connections.

Executive Education Services

Cranfield University
Cranfield, MK43 0AL, UK

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Please check www.cranfield.ac.uk for the latest details.

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