

Materials Engineering and Manufacturing Technology

Cranfield is a distinctive, wholly postgraduate university – a forward –thinking institution where world-class research and innovation leads to world – changing solutions.

The Department works closely with industry, undertaking research and consultancy for industrial clients, non-government and government organisations. We are rated in the top three in the UK for the impact of our mechanical, aeronautical and manufacturing research*.

Research in materials engineering is directed towards design, processing, characterising and enhancing properties together with the development and use of associated manufacturing technologies and application testing. An extensive range of facilities underpins the work undertaken.

Capabilities

We are able to offer a wide range of research support based around our unique pool of expertise and supported by our state-of-the-art facilities. Examples of research areas include:

Surface Science and Engineering

- Coating of high temperature components
- Thermal barrier coatings
- Wear and corrosion resistant coatings
- Self-diagnostic and smart coating systems

Energy and Power Generation Technology

- Clean power from fossil and renewable fuels
- Extending power plant component lifetimes
- Modelling the performance of alloys and coatings

Welding Engineering and Laser Processing

- Welding process development, metallurgy and welding automation.
- High productivity welding; pipelines, aerospace and automotive applications
- Additive manufacturing and laser micro joining

This provides a powerful combination of multidisciplinary skills that ensures both industrial relevance and academic rigour through industrial scale research and development that differentiates the Cranfield activity from other universities.

*As assessed in the 2008 Research Assessment Exercise (RAE).

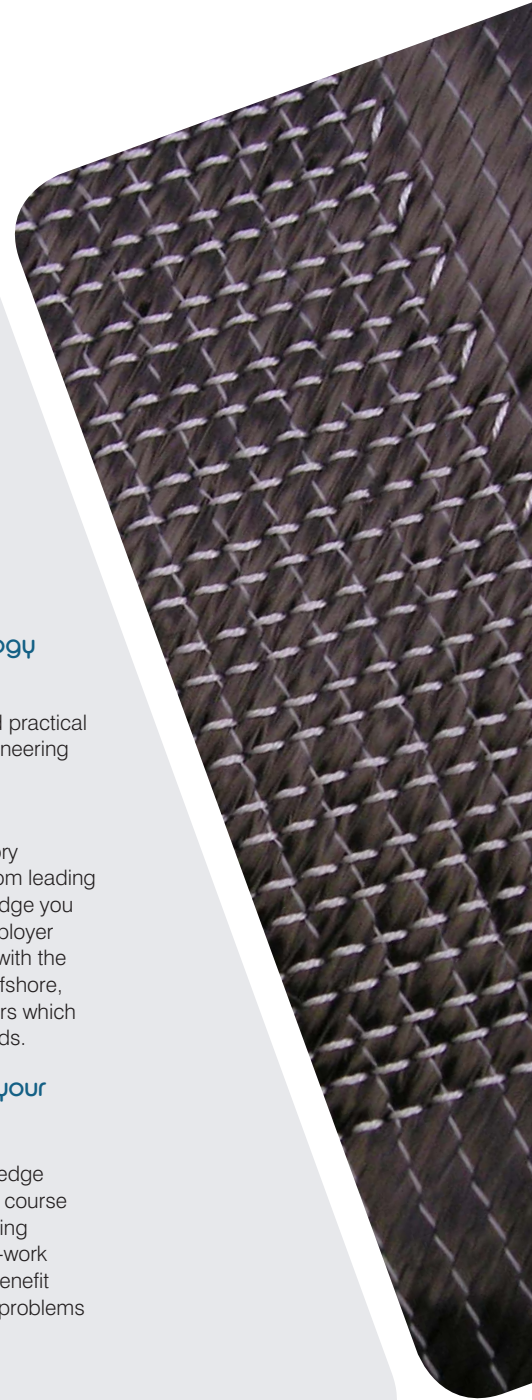
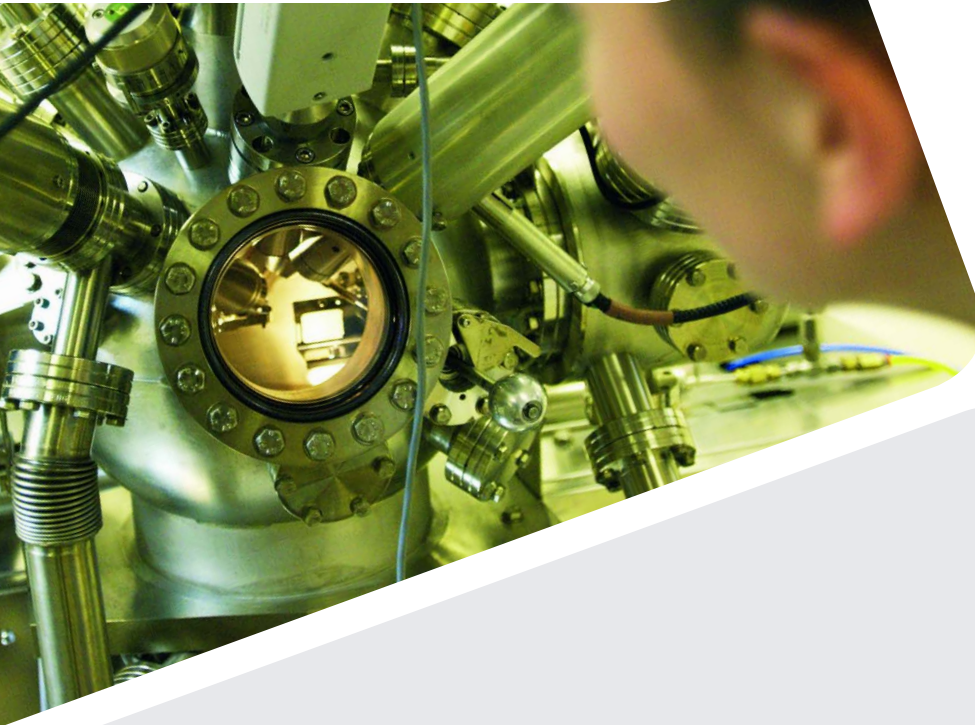
Composite Design, Processing and Manufacturing

- Cost effective, large scale and automated manufacturing
- High performance composite structures
- Nanocomposites
- Polymer and powder micro-injection moulding

Microsystems and Nanotechnology

- MEMS modelling and processing
- Processing of functional nanomaterials and films
- Microscale structuring/direct writing
- Design and manufacture of 3-D microdevices
- Local energy harvesting, generation and storage





**MSc Advanced Materials
MSc Manufacturing Technology and
Management**

The materials programme has been designed to equip engineers and scientists with the knowledge, skills and practical experience that permit development of current and next generation products through training in materials engineering and manufacturing technology.

Focus on your career

Industry needs materials experts. Successful students are able to secure positions and develop their careers in a range of international research and industrial sectors. Whether a new or recent graduate, or seeking a career-change, the course enhances your competencies.

Courses are accredited by the Institute of Materials, Minerals and Mining (IOM3) meeting the academic requirements for Chartered Engineer status.

Benefit from our expertise and facilities

You will be working with a wide range of research facilities, many of which are unique to Cranfield.

The National High Temperature Surface Science Engineering Centre houses the largest combined coatings and test facilities in a university, worldwide. We have a global reputation for designing coatings for extreme and hostile environments tested in specialised rigs within this Centre and the Energy and Resource Technology Centre.

The Welding Engineering laboratories boast the highest power fibre laser in the UK, a hyperbaric chamber for deep weld simulation and state-of-the art equipment for arc welding.

Extensive laboratories in the Composite Research Centre, including an Autoclave, RTM injection facilities and automated equipment which extends capabilities to lay up components.

Microsystems and nanotechnology activities benefit from over 100m² of clean rooms, to develop novel devices from initial concept through to working prototype. All centres are supported by excellent facilities in materials and optical characterisation.

**MSc Materials for Energy Systems
MSc Microsystems and Nanotechnology
MSc Welding Engineering**

Benefits from our links with industry

The courses are directed by an industrial advisory committee comprising senior representatives from leading organisations. This means the skills and knowledge you acquire from the programme are relevant to employer requirements. The department has strong links with the aerospace, automotive, defence, motorsport, offshore, manufacturing, medical health and sports sectors which ensures the courses are aligned to industry needs.

Benefit from practical experience in your work-based projects

Industrially supported and relevant project work undertaken enables you to assimilate the knowledge and skills gained from the taught element of the course and put these into real world practice while gaining transferable skills in project management, team-work and independent research. Part time students benefit from addressing their employer's real business problems supported by our academic supervision.