

School of Engineering





Contents

- 05 Welcome
- 07 A unique University
- 09 The School of Engineering
- 11 Research and consultancy
- 13 Postgraduate study
- 15 Short courses/CPD
- 17 Experimental facilities
- 19 Capabilities
- 20 School statistics
- 23 How to find us

www.cranfield.ac.uk/soe



“ The School of Engineering is one of the largest providers of engineering education, research and technology support in the UK. ”

Welcome

The School of Engineering is one of the largest providers of engineering education, research and technology support to key industrial sectors of the global economy.

It brings together the proud heritage of the College of Aeronautics and the School of Mechanical Engineering which between them were the founding schools of Cranfield University at its establishment in 1946. Since then the School's staff have contributed strongly to global developments in the aerospace, energy, transport and process engineering sectors.

This document presents a profile of the School's capabilities and activities. Four key factors of the profile are highlighted below:

1. Cranfield graduates more engineering and technology postgraduates than any other UK University.
2. The School has close relationships with major aerospace companies including Airbus, BAe Systems, Boeing, Rolls Royce, China Aviation Industry Corporation and Hindustan Aeronautics Limited, among many others.
3. It is the only School in the UK that operates two of its own flight test aircraft, with four commercial pilots engaged in teaching and research on its staff.
4. The School runs large, near industrial scale facilities, such as a multi-phase flow rig, icing wind tunnels, compressor test rigs, automotive dynamometers and flight simulators. These are used both by students and the external industrial community for testing and product development.

My colleagues and I will be pleased to answer your questions or to help you with your organisation's training and technology needs.

Professor Philip John
Interim Head, School of Engineering





“ To create and transform world class science, technology and management into viable, practical, environmentally desirable solutions that enhance economic development and the quality of life. This mission is delivered internationally through teaching, research and consultancy. ”

A unique University

Cranfield University is a distinctive university with a worldwide reputation for innovation.

The primary theme running through Cranfield's history is a commitment to and passion for research that makes a difference to the world in the fields of science, technology and management.

The forerunner of Cranfield University was the College of Aeronautics, created in 1946 and based at the RAF station in Cranfield, Bedfordshire. Through the 1950s and 1960s, the development of many aspects of aircraft research and design led to considerable growth and diversification into other technologies and management.

In 1969, the College of Aeronautics became the Cranfield Institute of

Technology incorporated by Royal Charter with full degree-awarding powers, and new departments were set up to cover work in the new subject areas, such as the Cranfield School of Management. The last 30 years have seen further substantial progress, including an academic partnership with the Defence College of Management and Technology at Shrivenham, in Wiltshire. The result is that Cranfield has grown to become Europe's largest centre for research, development and design in the service of both UK and global industries.

Today, Cranfield University offers a wide range of research and technology services. It also provides a professionally intense educational experience for students and a wide range of short courses for over 12,000 delegates from industry per year.



“ The School is dedicated to carrying out focused fundamental research and applying it to meet the needs of society and industry. ”

The School of Engineering

The School of Engineering is one of the University's five schools:

- Applied Sciences
- Engineering
- Defence & Security
- Health
- Management

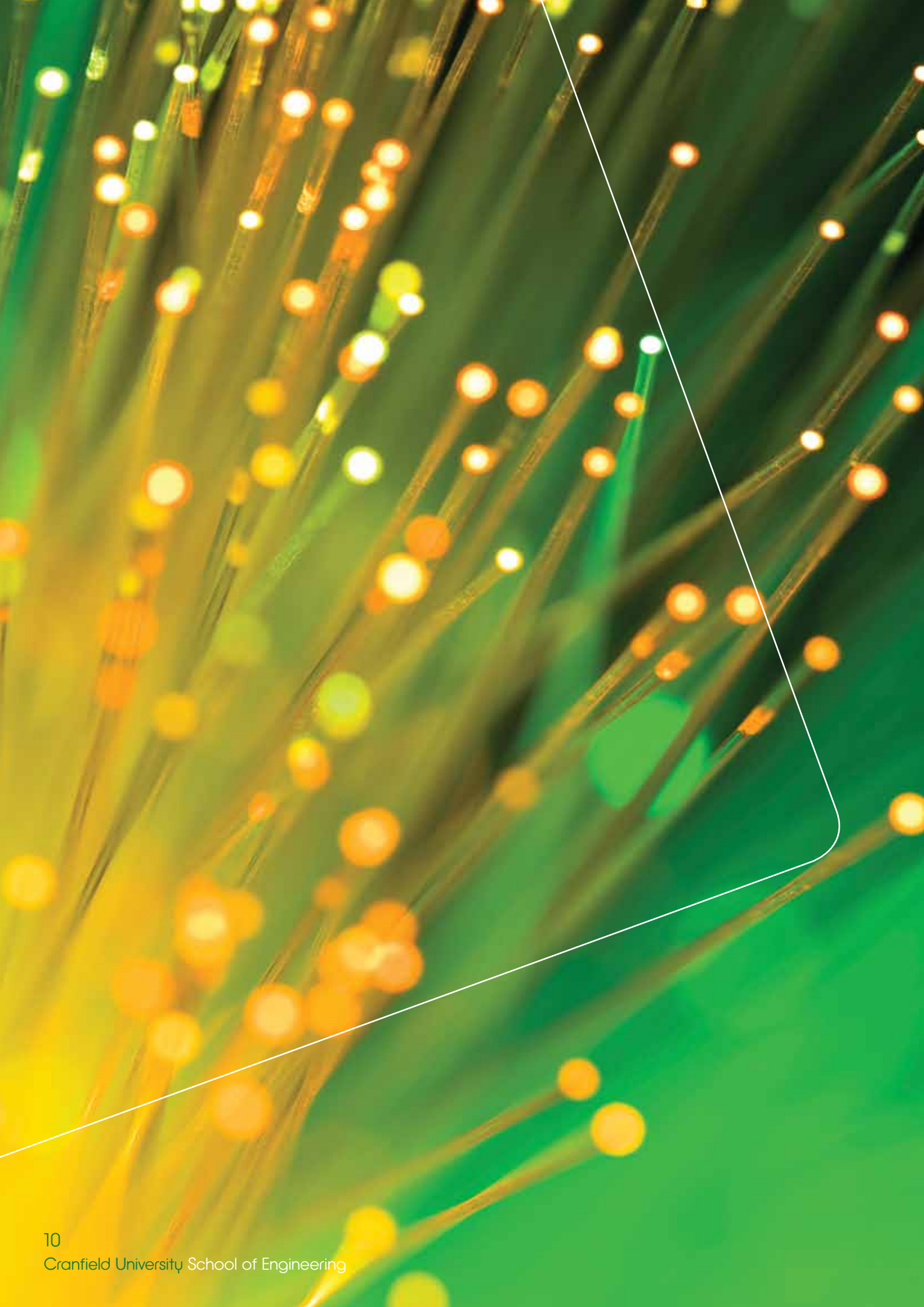
The School is dedicated to carrying out focused fundamental research and applying it to meet the needs of society and industry. We provide a wide range of Masters, Doctoral and professional development courses and carry out extensive technology development and consultancy for our customer base. Our research and teaching functions are closely linked to industry as well as the public and defence sectors across the UK, Europe and internationally.

Key activities:

- Collaborative research and consultancy
- Postgraduate programmes (MSc, PhD, EngD)
- Short courses/Continuing Professional Development courses



The School of Engineering Multiphase Flow Facility



“ Our research income, measured as a percentage of our turnover, puts us as one of the top five research intensive universities in the UK. ”

Research & consultancy

Cranfield University is ranked third in the UK for the impact of its mechanical, aeronautical and manufacturing research by the 2008 Research Assessment Exercise (RAE).

Our research income, measured as a percentage of our turnover, puts us as one of the top five research intensive universities in the UK, alongside UCL, Oxford, Cambridge and Imperial College. Our work with commerce and industry far exceeds that of any other UK university with 86 per cent of income generated from a competition of one form or another. This is a result of our industrial and commercial sponsor's and student's

recognition of the relevance of our teaching and research. The University's blue-chip client list reflects the business success stories of today and includes close and long standing strategic partnerships with Boeing, BAe Systems, Airbus, Rolls-Royce and EADS Astrium.

Our staff carry out extensive research and consultancy work for companies such as Lockheed Martin, Northrop Grumman, MBDA, IBM, Insys, Thales, GE Commercial Aviation, Dunlop Aerospace and with all major airlines such as Emirates, easyJet, Virgin Atlantic and regulatory bodies such as the FAA, EASA and the CAA.



“Cranfield graduates more engineering and technology postgraduates than any other UK University.”

Postgraduate study

Cranfield is a distinctive university with an international community and a truly global reputation. Furthermore, Cranfield graduates more engineering and technology postgraduates than any other UK University.

Our students benefit from our close links with industry, low student: staff ratio, near industrial scale state-of-the-art facilities and a proven track record of relevant, graduate employment. Our latest institutional audit – where the quality and standards of our teaching was assessed – bestowed the highest level of recognition possible.

The School of Engineering offers a wide range of full and part-time MSc and PhD programmes.

MSc courses:

Advanced Mechanical Engineering

Aerospace Dynamics MSc with options:

- Aerodynamics
- Flight Dynamics

Aerospace Vehicle Design MSc with options:

- Avionic Systems Design
- Structural Design

Aircraft Engineering MSc

Airport Planning and Management

Executive Airport Planning and Management

Air Transport Management

Executive Air Transport Management

Airworthiness

Astronautics and Space Engineering

Automotive Product Engineering

Automotive Technology Management

Autonomous Vehicle Dynamics & Control

Computational Fluid Dynamics

Computational and Software Techniques in

Engineering with options:

- Computer Aided Engineering
- Digital Signal and Image Processing
- Grid Computing & e-Engineering
- Software Engineering for Technical Computing

Design of Rotating Machines

Driver Behaviour and Education

Ergonomics and Safety at Work

Human Factors and Safety Assessment in

Aeronautics

Process Systems Engineering with options:

- Energy Systems and Thermal Processes
- Process Systems Technology

Safety and Accident Investigation

Structures, Crashworthiness and Impact

Thermal Power with options:

- Aerospace Propulsion
- Gas Turbine Technology
- Power, Propulsion and the Environment
- Rotating Machinery Engineering and Management



Marco Kalweit receiving the Fan Makers Company Prize in Fluid Engineering from Professor John Salter.



“With over 12,000 delegates a year, Cranfield University is a major provider of short courses to industry professionals.”

Short courses/Continuing Professional Development

Cranfield University is a major provider of short courses to industry professionals, with over 12,000 delegates attending courses every year. The School of Engineering offers a wide range of open and bespoke short courses in the following areas:

- Aerospace Sciences and Engineering
- Air Transport Management
- Applied Mathematics & Computing
- Automotive Technology
- Driver Behaviour
- Engineering Photonics
- Gas Turbine Engineering
- Materials & Structures
- Power and Propulsion
- Process and Systems Engineering
- Renewable Energy
- Safety, Risk and Reliability
- Systems Engineering & Human Factors



A practical field exercise - part of the Accident Investigation short course programme



“ The School of Engineering offers a wide range of near industrial scale experimental research facilities. ”

Experimental facilities

The School of Engineering offers a wide range of near industrial scale experimental research facilities to be used by masters and doctoral students as well as commercial clients.

Among the School's major test facilities are:

- Accident Investigation Laboratory
- Aerosoft Flight Simulator
- Aircraft Cabin Simulators
- Aircraft Design and Prototyping Suites
- Air-Vehicle Modelling and Simulation Environment
- Atmospheric Boundary Layer Wind Tunnel
- Automotive Road Dynamometer
- Bulldog 2 Seat Flight Test Aircraft
- Combustion Testing Laboratory
- Compressor Test Cells
- Driving Simulator
- Digital Signal and Image Processing Computer Laboratory
- Horizontal Axis 8x6' Wind Tunnel
- Jetstream 31, 15 Seat Turbo-prop Flight Test Aircraft
- Large Flight Simulator
- Laser Velocimetry Instruments
- Low Speed Compressor Test Cells
- Multiphase Flow Facility
- Ocean Wave Testing Facility
- Pebble Bed High Temperature Test Facility
- Photonics Laboratory
- Space Satellite Assembly Clean Room
- Two Icing Tunnels
- Vertical Axis Renewable Energy Wind Turbine Test Bed
- Virtual Reality Facility



Space Satellite Assembly Clean Room



Capabilities

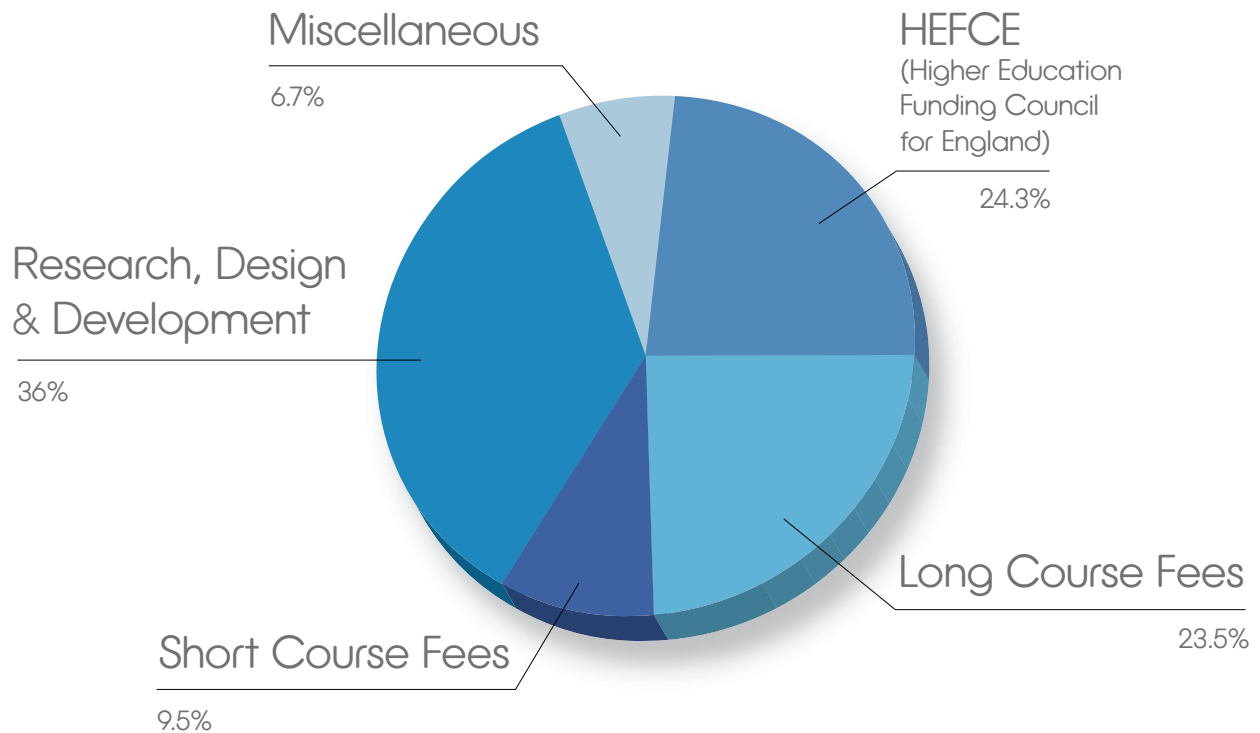
School of Engineering Capabilities	
Application sectors	Technologies
<ul style="list-style-type: none"> • Aerospace • Air Traffic Management • Automotive • Built Environment • Defence • Energy • Environment • Marine & Offshore • Medical/Health • Manufacturing • Nuclear • Process Engineering • Space • Transportation 	<ul style="list-style-type: none"> • Acoustics • Aircraft Design • Autonomous Systems • Avionics • Bioengineering • Communications • Composite Materials • Metallic Materials • Computer Visualisation • Control Systems • Information and Data Fusion • Novel Fuel Sources • Optics • Power and Propulsion • Robotics • Sensors • Signal Processing
Multidisciplinary capabilities	Engineering disciplines
<ul style="list-style-type: none"> • Airworthiness • Availability, Maintainability and Reliability • Business Management • Human Factors • Knowledge Management • Simulation and Modelling • Safety • Survivability • Sustainability • Systems Engineering 	<ul style="list-style-type: none"> • Advanced Computing • Aerodynamics • Aeronautical Engineering • Civil Engineering • Computational Fluid Dynamics • Electronics Engineering • Materials Engineering • Mechanical Engineering • Software Engineering



The gas turbine display area in the School of Engineering

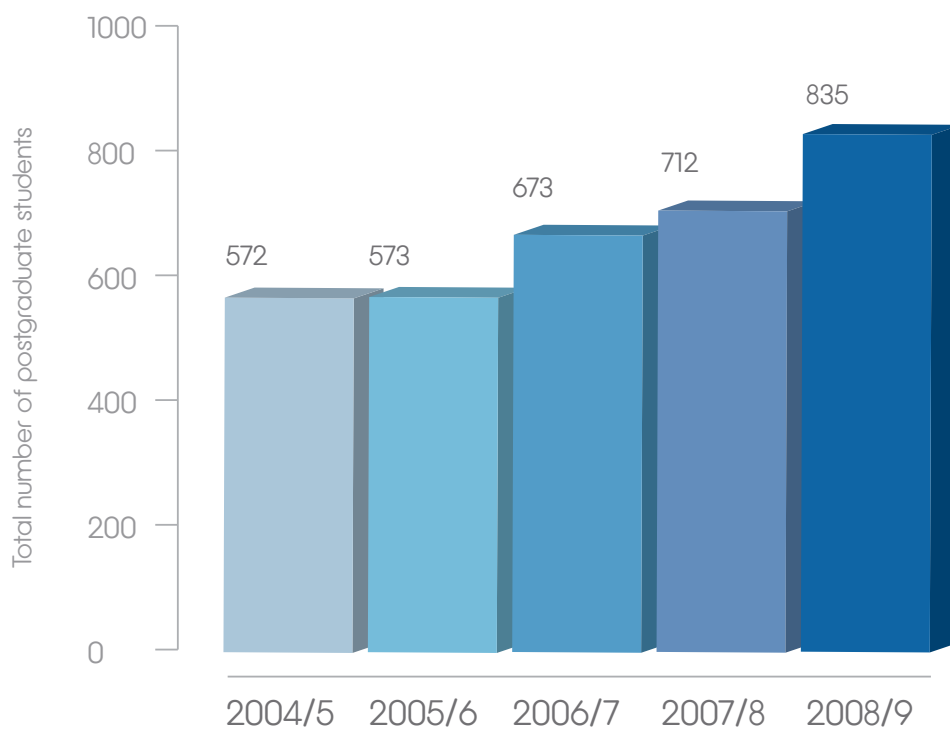
Income sources

School of Engineering income sources



Student population

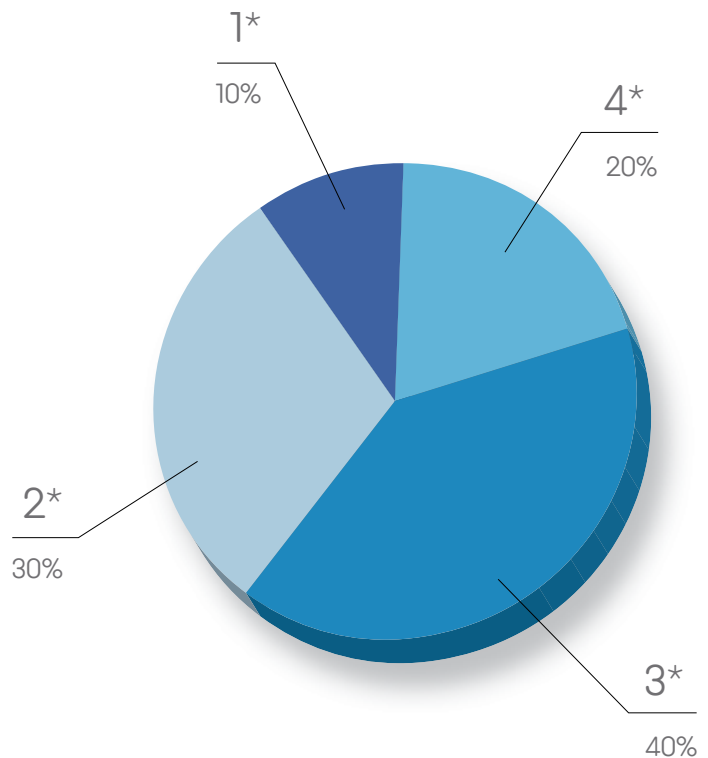
School of Engineering student population



RAE 2008

The School of Engineering and School of Applied Sciences provided a joint submission to the 2008 Research Assessment Exercise (RAE). Cranfield University was ranked third in the UK for the impact of its research in mechanical, aeronautical and manufacturing engineering.

The graph to the right depicts the research profile as a percentage of activity at each of the starred levels assessed.



Volume of star level research activity

UK ranking	Institution	Staff submitted
1	Loughborough	143.4
2	Southampton	132.5
3	Cranfield	95.8
4	Imperial College	67.0
5	Nottingham	46.5
6	Leeds	40.5

Research profile definitions:

- 4* Research that is world leading in terms of originality, significance and rigour.
- 3* Research that is internationally excellent in terms of originality, significance and rigour.
- 2* Research that is internationally recognised in terms of originality, significance and rigour.
- 1* Research that is nationally recognised in terms of originality, significance and rigour.
- U Unclassified given for research that does not fall into any of the above categories.



An ideal location

Cranfield campus in Bedfordshire, embracing our bustling airport, is set in extensive grounds with plenty of free car parking, excellent housing provision and superb sports and recreation facilities.

Here you will find the Schools of Engineering, Management, Health and Applied Sciences.

Our exclusively postgraduate student community ensures that the atmosphere is mature and focused.

The campus lies 10 minutes from the M1 motorway, the UK's main north/south artery, and has rail and road access to most major airports.

Situated mid-way between Oxford and Cambridge, it is close to thriving Milton Keynes, a new town with one of the largest covered shopping centres in Europe, and the historic riverside town of Bedford.

Full travel information is available from:

www.cranfield.ac.uk/locations/cranfield

Further information

School of Engineering
Building 83
Cranfield University
Cranfield
Bedfordshire
MK43 0AL, UK

T: +44 (0) 1234 754749
F: +44 (0) 1234 758221
E: soe@cranfield.ac.uk

www.cranfield.ac.uk/soe