Computational Fluid Dynamics

MSc/PgDip/PgCert

This course has been designed to reflect the wide applications of Computational Fluid Dynamics. You will learn to understand, write and apply CFD methods across a wide broad range of fields, from aerospace, turbomachinery, multi-phase flow and heat transfer, to microflows, environmental flows and fluid-structure interaction problems. Tailor your course by choosing from a range of specialist modules covering application-specific methods and techniques. This course bridges the gap between the introductory level of undergraduate courses and the applied expertise acquired by engineers using CFD in industry. You will gain the knowledge and appreciation of CFD methods necessary for a strong foundation to a career in this exciting engineering discipline. It provides a solid background so that you will be able to apply CFD methods as a tool for design, analysis and engineering applications. With a strong emphasis on understanding and application of the underlying methods, enthusiastic students will be able to write their own CFD codes during the course. Sharing some modules with the MSc in Aerospace Dynamics gives you the opportunity to interact with students from other disciplines. In recent years, our students have been had the opportunity for work-based placements at the Aircraft Research Association (ARA), European Space Agency (ESA) and DAF Trucks.

Course structure

The course comprises a taught component of compulsory modules and elective application modules, plus an individual research project. The course is designed to reflect the broad range of CFD applications by providing a range of elective modules.

Individual project

The individual research project is undertaken during May and September. It allows you to develop specialist skills by taking the theory from the taught modules and combining it with practical application. The research project gives you the opportunity to produce a detailed piece of work either in close collaboration with industry, or on a particular topic which you are passionate about.

Future career

Strategic industrial links ensure that the course meets the needs of the organisations competing within the computational sector therefore making our graduates some of the most desirable in the world for companies to recruit. An increasing demand for CFD specialists with practical, technical knowledge within a wide range of sectors has seen our graduates employed by leading companies including Alstom, BAE Systems, Rolls-Royce plc, European Space Agency and Bentley. Many of our graduates go on to complete PhD degrees, with thesis topics often supplied by companies with a view to employment after graduation - an approach that is being actively encouraged by a growing number of industries

Example modules

The taught programme consists of compulsory and elective modules.

Compulsory:
• Data Analysis and Uncertainty,
• Grid Generation / Computer Aided Design,
• Introduction to Fluid Mechanics and Heat Transfer,
• Numerical Methods and High Performance Computing,
• Numerical Modelling for Compressible Flows,
• Numerical Modelling for Incompressible Flows,
• The Role of Experimental Data in CFD,
• Turbulence Modelling.

Duration:
MSc: Full-time - one year, Part-time - up to three years,
PgDip: Full-time - up to one year, Part-time - two years,
PgCert: Full-time - up to one year, Part-time - two years.

Start date:
October.

Location:
Cranfield Campus.

Entry requirements:
A first or second class UK Honours degree in a relevant subject or an equivalent international qualification or relevant work experience. Applicants who do not fulfil the standard entry requirements can apply for the Pre-master's in Engineering programme, successful completion of which will qualify them for entry to this course for a second year of study.

Please visit: www.cranfield.ac.uk/entryrequirements for more information.

ATAS Certificate:
Students requiring a visa to study in the UK may need to apply for an ATAS certificate to study this course.

Contact details

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For further information please visit
www.cranfield.ac.uk/courses/taught/ computational-fluid-dynamics