



# Astronautics and Space Engineering

MSc

The space sector contributes £7.5bn per annum to the UK economy alone, and space activity across Europe and the world continues to thrive. There is a continuing need for talented employees with a good understanding of spacecraft systems engineering, coupled with a broad range of technical skills. Evolving constantly since 1987, this course has prepared graduates for highly successful careers in the space sector. Suitable for graduates in engineering, physics or mathematics, this course will prepare you for a career in this exciting field, from earth observation to planetary exploration, launch vehicles to spacecraft operations, and much more. This Masters is highly respected around the world, and many of our students obtain employment/research offers in the space sector before the course finishes. We encourage interaction between our students and potential employers at events such as the Group Design Project industry presentation, dedicated interview days, and Alumni Conferences. In many space companies and agencies within Europe you will find our former graduates, some in very senior positions. Many of them continue to contribute to the course, forming a valuable network of contacts for those entering the industry and this course will equip you with the skills required to join them in a successful career in industry or research.

## Course structure

The course consists of compulsory modules, optional modules, a group design project and an individual research project. The core modules build your understanding of space engineering before you select specialist modules.

## Individual project

The individual research project is the largest single component of the course typically taking place between April and August. It allows you to develop specialist skills in an area of your choice by taking the theory from the taught modules and joining it with practical experience. A list of suggested topics is provided, and includes projects proposed by academic staff and industry.

## Group project

This is a space mission design study conducted in teams of 10-15 students. It typically takes place from September to April and is assessed by written reports and presentations. It emphasises space systems engineering methodologies, and is designed to prepare our graduates for the project-based working environment often found in space companies and agencies.

## Future career

This course is highly respected around the world, and many of our students receive employment/research offers in the space sector before the course finishes. At events such as the Group Project industry presentation, dedicated interview days, and Alumni Conferences, we encourage interaction with potential employers. Our graduates have been recruited by organisations including EADS Astrium, SSTL, Vega, ABSL, Tessella, OHB, Rutherford Appleton Laboratory and the European Space Agency in roles including Systems Engineer, Spacecraft Operations Engineer, Thermal Analyst and Space Robotics Engineer. If your interests lie in research, many former students have gone on to pursue PhD studies.

## Example modules

The taught element is a mixture of assessed, nonassessed, compulsory and optional modules.

### Compulsory

- Space Systems Engineering
- Astrodynamics and Mission Analysis
- Space Propulsion
- Space Communications
- Launch and Re-Entry Aerodynamics
- Environmental Control and Life Support Systems
- Modelling of Dynamic Systems
- Space Environment
- Payload Engineering and Instrumentation
- Earth Observation and the Environment
- Structural Mechanics
- Impact Dynamics and Spacecraft Protection
- Spacecraft Data Handling and Software Development
- Introduction to Spacecraft Operations
- Structural Dynamics

### Optional

- Control Systems
- Multivariable Control for Aerospace Applications
- Sensors and Data Fusion
- Spacecraft Attitude Dynamics and Control
- Design and Analysis of Composite Structures
- Aerospace Navigation and Sensors
- Finite Element Analysis

### Duration:

MSc: Full-time - one year, Part-time - up to three years

### Start date:

October

### Location:

Cranfield Campus

### Entry requirements

A first or second class UK Honours degree or equivalent, in mathematics, physics or an engineering discipline. Generally, our intake has both a physics and engineering background. Students from other sciences, mathematics, or computing backgrounds are welcome to apply and we will consider applications on a case by case basis.

### 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/astronautics-and-space-engineering](http://www.cranfield.ac.uk/courses/taught/astronautics-and-space-engineering)