



MASTER'S DEGREE IN AEROSPACE SCIENCE AND TECHNOLOGY

EETAC

Castelldefels School of Telecommunications
and Aerospace Engineering



**UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH**

International Campus of Excellence

MASTER'S DEGREE IN AEROSPACE SCIENCE AND TECHNOLOGY

The master's degree in Aerospace Science and Technology (MAST) provides advanced training in the sciences and technology that are currently most widely used and applied in the fields of aeronautics and space exploration. Graduates of this master's degree will have been trained in an interdisciplinary area of knowledge that includes the study of theoretical and practical fundamentals, techniques, methods and processes, and they will be skilled at promoting, defining and managing innovative research projects.

The UPC's Castelldefels School of Telecommunications and Aerospace Engineering (EETAC) organises the master's degree in collaboration with the Centre National d'Études Spatiales (CNES), the European Space Agency (ESA) and the Universitat Autònoma de Barcelona (UAB).

Selected for the Masters of Excellence grant programme of the Catalunya La Pedrera Foundation

8

double-degree pathways with Cranfield University (UK)

MAST students' technical/scientific backgrounds and nationalities are varied, which creates a diverse environment that is very similar to a professional aerospace environment

Curriculum

This information may be subject to change. Up-to-date information is available at upc.edu.

90 ECTS credits

1st semester

Aerospace Materials	5
Aerospace Seminars	5
Analogue and Digital Signal Processing for Aerospace Applications	5
Further Fundamentals of Aerospace Science and Technology	5
Computational Fluid Dynamics in Aerospace Engineering	5
Numerical Methods in Aerospace Engineering Systems	5
Space Systems Engineering	5

2nd semester

Astrodynamics	5
Architecture of Nano- and Picosatellites	5
Aviation Weather	5
Life Support Systems in Space	5
Modern Control Systems	5
Radionavigation	5
Satellite Communication Principles	5
Science in Microgravity	5
Test and Instrumentation Systems in Aerospace Applications	5
Unmanned Aerial Vehicles	5

3rd semester

Master's Thesis	30
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Compulsory subjects

Optional subjects

Structure

The programme consists of 90 ECTS credits distributed over three semesters of 30 ECTS credits each. Students may enrol in the programme in September (recommended) or February. The first semester is devoted to compulsory courses and the second semester to optional courses. The master's thesis (30 ECTS credits) is carried out in the third semester at a university department or laboratory, a research institute, an aerospace company or a space agency.

Aimed at

The 30 places on the master's degree are aimed mainly at students with bachelor's degrees in aerospace, industrial, mechanical, telecommunications or electronic engineering, or in physics.

Timetable and campus

Lectures are scheduled from Monday to Friday from 3 p.m. onwards, with special lectures at other times, some of them in the morning. Classes are held on the UPC campus in Castelldefels.

Double degrees

Students of the master's degree in Aerospace Science and Technology can earn a double degree by passing a number of credits of one of the master's degrees at Cranfield University.

Professional opportunities

Graduates of this master's degree will be experts who are qualified to work in:

- University departments, institutes and research centres, in order to produce a doctoral thesis.
- R&D&I departments in industry in the aerospace field or similar.

General competencies

- Identify and demonstrate knowledge of current aerospace R&D&I activities in academia, industry and major space agencies.
- Identify and apply the fundamental theoretical, experimental and numerical analyses that are currently used in aerospace engineering.
- Identify and manage, in a consistent manner, the various types of aerospace vehicles and the technological, design and implementation aspects of payloads in scientific missions.
- Participate in an aerospace R&D&I project and contribute a view and new knowledge on cutting-edge use techniques in the field.

Specific competencies

The specific competencies are associated with the optional subjects and will therefore depend on the pathway chosen by the student. Some of them are:

- Identify the various types of materials that are used to manufacture the parts of an aeroplane, including the fuselage and engines, and select the right one for each application, as well as those that are used to build aerospace vehicles.
- Use tools, devices and systems for analogue and digital signal conditioning.
- Apply numerical methods for aerospace engineering, particularly their applications in fluid dynamics.
- Apply the scientific method to study aerospace phenomena.
- Apply systems engineering in the aerospace environment to design and manage the technological aspects of a mission.
- Write and present an original, individual piece of work and defend it to an examination committee. The work must be a research study in the field of aerospace engineering that demonstrates the skills acquired by the student, incorporates advances and novelties in the field and contributes novel ideas.



The U.S. Cygnus space freighter and its cymbal-shaped UltraFlex solar arrays. (Mark Garcia/NASA)

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 **The MAST is a must**

Further information:
mast.masters.upc.edu
master.aerospace@upc.edu



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