

## MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING




The Terrassa School of Industrial, Aerospace and Audiovisual Engineering (ESEIAAT) has substantial experience and an outstanding reputation and is a benchmark in the fields of industrial, aerospace and audiovisual engineering. Its teaching model is based on the learning- by-doing method, in which students engage in real-world projects. The School, which stands out for its focus on innovation, has agreements with universities around the world and solid relationships with business partners. It offers a programme for high achievers and double degree programmes.

The Universitat Politècnica de Catalunya · BarcelonaTech (UPC) is a renowned public institution of research and higher education that is a benchmark in the fields of engineering, architecture, sciences and technology. With its 50 years of history, the UPC welcomes more than 30,000 students every year and hosts the largest concentration of technological research and innovation in southern Europe. It is the best Spanish university in Engineering and Technology, according to the 2020 QS World Universities Rankings by Subject.

## Your talent make us proud

Further information:  
[eseiaat.upc.edu](http://eseiaat.upc.edu)  
[admissions.eseiaat@upc.edu](mailto:admissions.eseiaat@upc.edu)

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Terrassa School of Industrial, Aerospace  
and Audiovisual Engineering

### ESEIAAT

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*International Campus of Excellence*

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# MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING

Developing faster and more efficient aircraft and spacecraft, optimising air transport and airport management in order to adapt to the sector's rapid growth and innovating in materials and propulsion systems are some of the possible career options for an aerospace engineer. The aerospace industry is evolving significantly every day and this growth requires vast teams of engineers with huge creative capacities working hard to find optimal solutions to great challenges. Most of our master's degree students find a job even before they have finished their studies.

The master's degree in Space and Aeronautical Engineering taught at the Terrassa School of Industrial, Aerospace and Audiovisual Engineering (ESEIAAT) aims to fulfil part of this demand by producing competent young professionals who are prepared to start a successful career in different fields of aerospace. The School offers seminars, workshops, visits and individual and group research projects to reinforce theoretical learning.

**+50%**  
of master's degree students are international students

**+60%**  
of doctoral candidates are international students

**90%**  
master's degree graduate employment rate

Font: 2nd graduate employment survey of graduates of Catalan universities by the Catalan University Quality Assurance Agency (AQU Catalunya)

Participation in international networks: **CLUSTER, TIME, CINDA and Smile-Magalhães**

## Curriculum

This information may be subject to change. Up-to-date information is available at [upc.edu](http://upc.edu)

**60 ECTS credits**

### 1st semester

Computational Engineering	5
Optional subjects	25

#### Optional subjects (5 ECTS credits each)

Advanced Aerodynamics; Advanced Aeroelasticity; Advanced Heat and Mass Transfer; Advanced Jet Engines; Advanced Propulsion; Advanced Rocket Engines; Aerospace Laboratories; Aircraft Architecture and Systems; Airport Building Systems; Airport Business Management; Airport Infrastructure Management; Airport Operations; Air Transport Management; Astrodynamics; Composite Materials; Hypersonic Aerodynamics; Internal Aerodynamics and Aeroelasticity of Turbomachines; Numerical Methods in Heat and Mass Transfer; Space Propulsion; Space Structures: Design and Behaviour; Spacecraft Design; Project Management: Key Agreements and Deals, and Turbulence: Phenomenology, Simulation, Aerodynamics.

Compulsory subjects

### Why this master?

The master's degree in Space and Aeronautical Engineering is aimed at graduates in aerospace engineering or related physical sciences and engineering who wish to improve their skills and knowledge. It provides advanced training in the field of space systems and aeronautical engineering that is scientific, technical and practical in nature and will allow students to work towards a professional and/or research career in the aerospace industry. The master's degree is aimed at graduates who will go on to seek employment in the aerospace industry or to pursue a research career in this field.

### Professional opportunities

This master's degree allows students to guide their career towards companies in the aerospace industry and areas such as space missions, space and aircraft propulsion, aircraft design and maintenance, fluid mechanics, materials research, airport infrastructure, air traffic management, wind energy, aerodynamics, civil and automotive aerodynamics, and the design of civil applications of UAVs.

### Work placements

The School has forums for establishing strong bonds between students and

companies, which usually lead to work placements and subsequent careers. Master's degree students often manage to combine their studies with work placement agreements supervised by the University.

### Master's thesis

All students are required to write and defend a master's thesis during the second semester. It can be carried out in the following research groups:

- Center for Structural Integrity, Reliability and Micromechanics of Materials (CIEFMA)
- Heat and Mass Transfer Technological Centre (CTTC)
- Acoustic and Mechanical Engineering Laboratory (LEAM)
- Laboratory of Aeronautical and Industrial Research and Studies (L'AIRE)
- Laboratory for Technological Innovation in Structures and Materials (LITEM)
- Motion Control and Industrial Applications Research Group (MCIA)
- Polymer and Composite Technology Research Group (POLYCOM)
- Advanced Control Systems (SAC)
- Thermodynamics and Physical Chemistry Group (TERFIQ)

### Research

Students on the master's degree can come into contact with the research projects that are carried out at the School through its research groups or by carrying out an individual piece of research.

Group research aims to involve students in a participative environment that every engineer should have some experience of when they enter the labour market. Under the supervision of an H2020 expert, each group drafts a full H2020 proposal using all of the templates and the evaluation rules of the European Commission. Individual research is meant for students who prefer to carry out a longer master's thesis (21 ECTS credits). During individual research, they begin to engage in the subject, which allows them to lay the foundations for their master's thesis and gives them the chance to develop more complex ideas or adapt better to external companies' work placement demands.

### Delivery and duration

The master's degree is taught face-to-face in English. It lasts one academic year beginning in September and is taught in the mornings and in the afternoons.

### 2nd semester

Research and Aerospace Project Management	5
Optional subjects	6
Master's Thesis	14

#### Optional subjects (3 ECTS credits each)

Acoustics; Advanced Design of the Movement Area; Advanced Space Propulsion; Application of GIS to the Built Environment; Design and Use of UAVs for Remote Sensing of the Environment; Game Theory; Geotechnical Engineering; Implementation and Testing of Metaheuristics for Optimisation Problems; Infrared Thermography for Building Diagnostics; Introduction to Metaheuristics for Optimisation Problems; Management and Operation of Terminal Buildings; Project Management: Key Agreements and Deals; Science and Technology Communication in the Media; Structure of New Generation Materials; and Thermal Turbomachines and Combustion.

Depending on the optional subjects chosen, students can take one of the following specialisations or simply a combination of subjects up to 25 ECTS credits:

- Air Transport and Airport Management
- Aerospace Vehicle Engineering
- Propulsion and Thermal Systems Engineering
- Spacecraft and Space Systems Engineering