

Aerospace Engineering courses at Sapienza

The long tradition of Sapienza University in the field of aerospace education dates back to the establishment in 1926 of the School of Aeronautical Engineering, which offered postgraduate training to a limited number of engineers.

The subsequent rapid expansion of the aerospace industry, and of activity in the sector, soon made it necessary to provide a more rounded form of teaching aimed at a wider range of users; this led in 1980 to the establishment of a 5-year degree course in Aeronautical Engineering, within the Faculty of Engineering.

In 1990, teaching in the space sector was introduced alongside aeronautics, and the degree course was given the new name of Degree in Aerospace Engineering.

Today, the teaching offer consists of a three-year combined aeronautics and space engineering course (**Degree in Aerospace Engineering**) and two separate Graduate Degrees: one in **Aeronautical Engineering** and the other in **Space and Astronautical Engineering**.

Typically, the teaching offer at Sapienza is based on **interdisciplinarity** that reflects technological developments in aerospace over recent decades as well as the particular characteristics of the industry, where multidisciplinary skills are increasingly seen as adding value.

Internationalisation is another special feature of our courses, which offer study pathways at the most important European schools of Aerospace Engineering, via the ERASMUS transfer programmes and the PEGASUS network.

Within the Degree Courses our students take part in **international activities** such as the Design/Build/Fly (DBF) competition that takes place every year in the U.S.A., where the world's most important aeronautical schools are represented and where Sapienza has regularly obtained prestigious results.

Similarly, in the space field our students have taken part in the European Student Moon Orbiter (ESMO) project promoted by the European Space Agency.

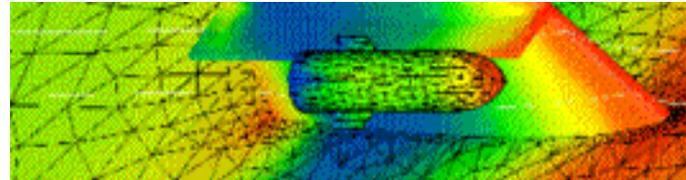
The main career prospects for Aerospace Engineering graduates are in the aeronautical and space industries, air transport service companies, national and international research agencies, space agencies, and universities.

Additionally, thanks to the general character of the training given, other career prospects exist in the engineering-related sectors. The job locations may be regional, national or, increasingly, anywhere in Europe.

Further information about the teaching offer, how to enrol on the courses, and social opportunities for students, is available

online at www.ingaero.uniroma1.it, along with other information about the research topics on which the tutors are engaged.

Within the Degree Thesis, the Masters, and the PhD courses, the students can take part in international research programmes that have achieved highly significant outcomes, for instance by contributing to the structural and propulsion design of the VEGA European launcher, or participating in the Mars Express, which proved the existence of water on Mars, and the Cassini-Huygens missions, which discovered an ocean below the surface of Titan.



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School of Aeronautical and Space Engineering

1450 students

130 graduates/year [Degree]

100 graduates/year [Graduate Degrees]

60 specific courses in this sector

40 tutors in the aerospace sectors

Degree Courses

- Three-year course in Aerospace Engineering
- Graduate Degree in Aeronautical Engineering
- Graduate Degree in Space and Astronautical Engineering

Level 2 Masters

- Satellites and orbiting platforms
- Space transport systems
- Civil aviation management

Research PhD

- Aerospace technology



SAPIENZA
UNIVERSITÀ DI ROMA

**Graduate Degree Course in
Aeronautical Engineering**

2014-2015



The Graduate Degree Course in Aeronautical Engineering offers the student advanced disciplinary and professional training, alongside specific engineering skills that enable them to address complex problems requiring the analysis, development, simulation, and optimisation of the various components of a fixed or rotating wing aircraft.

Teaching focusses mainly on the most advanced investigative and design tools and on innovation in the aeronautics industry, with particular reference to improving efficiency, weight reduction, and reducing chemical and noise pollution.

In terms of methodologies and applications, the two years of the Graduate Degree Course further develop the solid body of knowledge acquired in the Degree Course.

Year 1 of the study pathway, which is shared by all the curricula, consolidates the student's understanding of the typical sectors of aeronautical engineering and covers the basics of telecommunications, automation, and electronics, which are not addressed in the three-year Degree Course.

Year 2 offers two different curricula of which one deals with disciplines (aerodynamics, propulsion, and structures), and the other deals with topics (flight systems and air transport).

The Graduate Degree Course in Aeronautical Engineering belongs to an Italian-French network that provides for reciprocal recognition with other selected universities and Grandes Ecoles in Paris, Grenoble, Toulouse, Nantes, and Nice.

CAREER PROSPECTS

Companies

- AgustaWestland
- Airbus
- Alenia Aeronautica
- Selex ES
- Avio
- ELV
- Nuovo Pignone
- Thales Alenia Space
- Vulcanair
- CAE
- Aerosekur
- EADS

Management companies

- Aeroporti di Roma
- Alitalia C.A.I.
- Meridiana

Regulatory bodies and

- Service providers
- ENAC
- ENAV

Research centres

- CIRA
- INSEAN
- CSM

Curriculum: Flight systems and air transport

Integrates the student's understanding of various disciplines (aerodynamics, mechanics of flight, automation, robotics, and electronics) to solve problems relating to the flight and ground segments of the air transport system.

The graduate will be a systems engineer operating in a scenario that integrates telecommunications, navigation, surveillance, on-board systems, flight simulation, and airport technical installations, in the technological aspects of aircraft management and air traffic control.

Year 1	Year 2
<i>Semester 1:</i>	<i>Semester 1:</i>
• Control systems	• Artificial intelligence I 
• Gasdynamics	• Aircraft guidance and navigation
• Aircraft structures	• Airport infrastructure
<i>Semester 2:</i>	• Aeronautical electrical systems
• Air traffic control	• Digital control systems 
• Aircraft flight dynamics	• Helicopter flight mechanics
• Aircraft engines	• Robust control 
	<i>Semester 2:</i>
	• Aircraft aerodynamics and design 
	• Environmental impact of aircraft engines 
	• Radio navigation aids



 The course is taught in English.

Curriculum: aerodynamics, propulsion, and structures

The graduate will be an engineer specialised in the numerical, theoretical, and experimental analysis of aeronautical materials and structures, possessing technological, design and construction skills relating to fixed and rotating wing aircraft.

Imparts the criteria and techniques for designing aircraft engines, along with understanding of the tools for determining the performance of propulsors. The student will acquire the ability to use theoretical, numerical, and experimental methods for the analysis and aerodynamic design of a complete aircraft or its components.

Year 1	Year 2
<i>Semester 1:</i>	<i>Semester 1:</i>
• Control systems	• Computational aerodynamics
• Gasdynamics	• Experimental aerodynamics 
• Aircraft structures	• Noise and vibration control 
<i>Semester 2:</i>	• Combustion 
• Air traffic control	• Experimental testing for aerospace structures 
• Aircraft flight dynamics	<i>Semester 2:</i>
• Aircraft engines	• Aerospace materials 
	• Aircraft aerodynamics and design 
	• Aeroelasticity 
	• Computational gasdynamics 
	• Environmental impact of aircraft engines 
	• Hypersonics
	• Nonlinear analysis of structures 
	• Smart composite structures 
	• Turbulence

