

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.

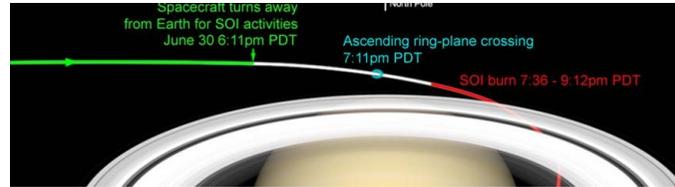
The main **career prospects** for Aerospace Engineering graduates are in the aeronautical and space industries, air transport service companies, national and international research agencies, space agencies, and universities.

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 often, 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 or 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.



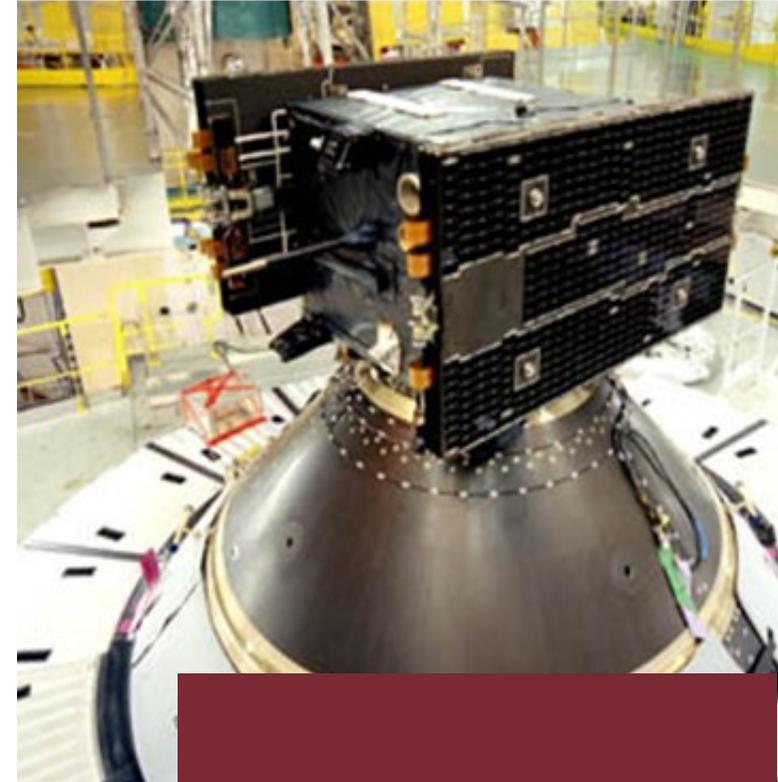
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School of Aeronautical and Space Engineering

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 Aerospace 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
Space and Astronautical Engineering

2014-2015

The Graduate Degree Course in Aeronautical and Space Engineering offers the student advanced disciplinary and professional training alongside specific engineering skills that enable them to address complex problems requiring analysis, development, simulation, and optimisation. It also trains them in the fundamental elements of manned and interplanetary space missions that use astronautical vehicles and re-entry capsules, with particular reference to their systems and scientific aspects.

Graduates holding our Degree in Aerospace and Astronautical possess the attitude and abilities that enable them to build, manage, and operate satellites and/or space transport systems.

DIDACTIC STRUCTURE

Year 1, which is the same for all curricula, consolidates the student's understanding of the typical sectors of space engineering (gas dynamics, space construction, mechanics of space flight, space propulsion, and space systems) and covers the basics of telecommunications, automation, and electronics, which are not addressed in the three-year Degree Course.

Year 2 offers a choice of different curricula that provide more in-depth knowledge of the structures and propulsion systems of launch vehicles, space platforms, Earth observation, and the planning of space and interplanetary missions.

The following 7 courses of the second year are taught in English: Aerospace materials, Artificial intelligence 1, Liquid rocket engines, Multibody space structures, Navigation systems, Spacecraft control, Solid rocket motors.

EMPLOYMENT 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
Meridiana
Sea

Regulatory bodies and Service providers

ENAC
ENAV

Research centres

CIRA
INSEAN
CSM



Curriculum: Remote sensing from Space

This curriculum is designed for students interested in the specialization in the field of exploitation of satellites for communications, and for acquisition and processing of surface-level imagery using optical and radar systems. Students will analyze the whole development cycle of remote sensing missions from payload design to image processing and to use of specific information extraction techniques.



Curriculum: Satellites

This curriculum is oriented to the overall design of a satellite system, with particular reference to: the general architecture of the platform; energy and thermal balance; structural and technological design; telecommunications, electrical and electronic subsystems; and orbital control and trim systems. The student can make use of a very large number of different laboratories and can benefit from the teaching staff experience in designing, constructing, launching small platforms and operating them in orbit.



Curriculum: Launch vehicles

Students selecting this curriculum will specialize in the design of: solid and liquid-fuelled propulsion systems; launch and orbital entry trajectories; launcher guidance, navigation, and control; launcher structural design. Benefitting from Sapienza's involvement in the VEGA program, the student acquires knowledge at system level that extends from the concept and design of a launch vehicle to the implementation of a launch campaign.



Curriculum: Missions

This curriculum prepares engineers specialized in earth orbit and solar system exploration missions. Orbital design and orbital control are studied, with particular reference to the most advanced techniques of trajectory analysis and optimization. Attention is also given to areas of significant technological relevance and interest such as robotic missions, and missions that use satellite constellations and formations