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 expansion of the aerospace industry, and of activity in the sector, made it necessary to provide a more complete structure of teaching devolved to 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 programes include 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 recognized as an added value .

Internationalisation is another special feature of our courses, which offer the possibility to spend 1-2 semesters 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., where the world most important aeronautical schools are represented and where Sapienza has regularly obtained prestigious results.

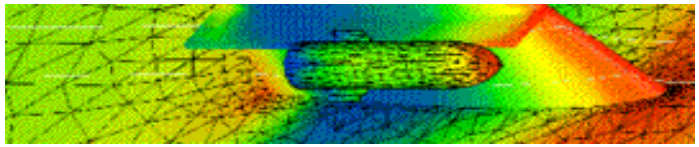
Similarly, in the space field our students have taken part in the European Student Moon Orbiter (ESMO) project promoted by the European Space Agency.
The main **career prospects** for Aerospace Engineering graduates are in the aeronautical and space industries, air transport service companies, national and international research agencies, space agencies, and universities.

Additionally, thanks to the general character of the training given, other career opportunities are found in the engineering-related sectors. The job locations may be regional, national or, more and more often, anywhere in Europe.

Further information about the teaching offer, how to enroll 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 faculty staff 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.

The report Thomson Reuters **2015 State of Innovation** in the Aerospace & Defense, places the Sapienza in 3rd place in the world and the 1st in Europe among the **most influential Scientific-Research Institutions in Aerospace (2004-2014).**



ADMINISTRATION OFFICE
Via Eudossiana, 18 - 00184 Rome Italy
Tel. +39 06 44585327
segreteriadidatticainagero@uniroma1.it
www.ingaero.uniroma1.it

Academic Council of Aerospace Engineering

1350 students
120 graduates/year [Degree]
60 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

- Aeronautics and Space Engineering

SAPIENZA
UNIVERSITÀ DI ROMA

Graduate Degree Course in Aeronautical Engineering

2015 - 2016

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 which is shared by all the curricula, consolidates the student 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 in Aerospace Engineering.

Year 2 offers two different curricula one of which 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
Sea

Regulatory bodies and Service providers

ENAC
ENAV

Research centres

CIRA
INSEAN
CSM

Curriculum: Flight systems and air transport

Students selecting this curriculum are training to the 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

Semester 1:

- Control systems
- Gasdynamics
- Aircraft structures

Semester 2:

- Air traffic control
- Aircraft flight dynamics
- Aircraft engines

Year 2

Semester 1:

- Artificial intelligence I
- Aircraft guidance and navigation
- Airport infrastructure
- Aeronautical electrical systems
- Digital control systems
- Helicopter flight mechanics
- Robust control

Semester 2:

- Aircraft aerodynamics and design
- Enviromental impact of aircraft engines
- Radio navigation aids

The course is taught in English.

Curriculum: aerodynamics, propulsion, and structures

Criteria and techniques for designing aircraft engines, along with understanding of the tools for determining the performance of propulsors are imparted in this curriculum. 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.

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.

Year 1

Semester 1:

- Control systems
- Gasdynamics
- Aircraft structures

Semester 2:

- Air traffic control
- Aircraft flight dynamics
- Aircraft engines

Year 2

Semester 1:

- Computational aerodynamics
- Experimental aerodynamics
- Noise and vibration control
- Combustion
- Experimental testing for aerospace structures
- Turbulence

Semester 2:

- Aerospace materials
- Aircraft aerodynamics and design
- Aeroelasticity
- Computational gasdynamics
- Environmental impact of aircraft engines
- Hypersonics
- Nonlinear analysis of structures
- Smart composite structures