

Space Systems Engineering

Accredited by the **Conférence des Grandes Écoles**

The ISAE's Masters programs benefit of the strong connections with the aerospace and defence industries, as well as automobile, energy, etc. developed over the past 100 years by SUPAERO and ENSICA merged under a unique Institute in 2007.

Aims

The TAS Astro - Space Systems Engineering Specialized Master degree program is a one-year professional course of study. The TAS Astro specialized Master allows students to develop a high level of competence in engineering science, current technology, engineering design and management of space systems. The TAS - Astro program is highly multidisciplinary and is aimed at developing engineering skills to easily enter the work world with great opportunities and significant chances of advancement on aerospace projects, either in a agency or in a company in a multinational environment.

The program is designed for students starting immediately after the completion of their graduate degree and for industrial employees who have enrolled through their companies' continuing education programs.

The TAS Aero curriculum includes a broad spectrum of subjects with the following objectives:

- to develop specific skills applied to space sector, in design development, space systems engineering and management of space projects,
- to acquire high competences related to technical aspects, international economical and legal concerns of space projects.

Organization

Head of Program

Prof. Bénédicte ESCUDIER

Phone: + 33 (0)5 62 17 80 91

E-mail: benedicte.escudier@isae.fr

Duration of studies: One year full time

Beginning of classes: September

Location: ISAE, Campus SUPAERO

Teaching language: English

Pedagogical approach

First semester: academic session of around 410h, provided by ISAE's permanent professors and various experts bringing current knowledge and experience from research center (ONERA), Space agencies (CNES, ESA), or European aerospace industry (Thales Alenia Space, Astrium/Space Transportation, Astrium/Satellites, Safran/SNECMA, etc.). This first semester includes:

- lectures, exercises, labs,
- engineering and design study seminars,
- laboratory sessions,
- written report and oral presentation,
- practical sessions, team work and industrial visits.

Second semester: students conduct a professional thesis within an aeronautical industry or organisation, in France or abroad and supervised by a tutor from the host organisation and from ISAE. The thesis is concluded by the preparation of a report and an oral dissertation in front of jury.

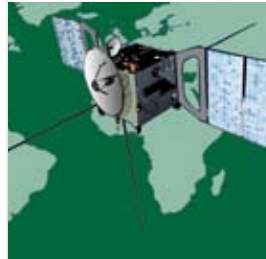
Syllabus

Missions and Systems - 140h

Space environment and effects
Orbital Mechanics and mission analysis
Dynamics and attitude Control
Reliability, Availability, Maintainability, Safety of space systems
Design of Launch Vehicles and Space Systems
Space communications
Operations and manned space missions
Navigation and localization satellite systems

Space projects environment - 120h

Examples of space projects
Space economics and law
Quality seminar
System engineering for space systems - Case study
Integrated team project



Satellites and Systems - 150h

Space propulsion
Satellite engineering
Digital control and real-time control by computer
Study case: attitude control of satellite
Advanced control
Guidance and control of satellites
Guidance and control of launch vehicles
Electrical architecture of satellites
Data processing architecture of satellites and on-board management

Conferences and seminars

Visits of companies: Intespace, ASTRIUM/ST, ONERA.

Harmonisation

A harmonization program can be offered to students in accordance with their initial education background, in particular in signal processing and automatic control.

Who can apply?

Applicants having a Master degree, or an equivalent degree in science or engineering, or a bachelor degree with 3 years of professional experience at least.

How to apply?

- Through application file, to be downloaded at www.isae.fr.
- Selection is made upon the study of the application file, possible interviews can be organized if necessary.
- Deadlines for application: from April to July 2009.
- Application fees: 65 € (non-refundable).
- Applications have to be sent:
Institut Supérieur de l'Aéronautique et de l'Espace
Direction des masters et mastères spécialisés
10, avenue Édouard-Belin - BP 54032
31055 Toulouse Cedex 4 - France

English proficiency

Adequate command of spoken and written English is required for admission.
Language qualification is requested TOEFL: 550 (paper-based)
Except if applicant's first language is English or total instruction of Bachelor or Master degree has been provided in English.

Tuition fees in 2009-2010 : 12 000 €.

French and European Students: 6000 € (students graduated in the year of application or the year before, and with no professional experience).
Dates: sept. 2009 - sept. 2010.

For any information

- Michel CHAUVIN, Deputy Director of Masters Programs: michel.chauvin@isae.fr
- Marie JENTET, Information and Marketing Manager: marie.jentet@isae.fr
- Web: www.isae.fr

Career opportunities

This TAS Astro Specialized Master program leads students to technical employment either in international industries or in research centers in aerospace world. Current position are: Project Managers of space systems, Experts in industry or public research laboratories, or in Consulting and services companies, etc.

Companies recruiting our students

EADS Group, Altran Group, Aéroconseil, Seditex, Snecma Groupe, Transiciel, Astek, Sagem, Thales Alenia Space, Esa, Inpe (Brazil), Instituto Mexicano de Comunicaciones (Mexico).

Witnesses

Interview Albert JOU, Spain, Graduated in 2007

"This specialized Master seemed the most interesting and the most adapted to my initial training at Barcelona University. I selected this Master for the great reputation of SUPAERO in aerospace sector and because it offered me the opportunity to enter in the space industry in contrast with my initial degree. The TAS Astro Master offers a comprehensive teaching program; it gave me a global view of space business from scientific, to technical, and to economy. The quality of the teaching is based on strong ties with aerospace industries, most of the courses are taught by experts or professionals, often involved in advanced projects.

After my graduation, I got position as technical manager at GTD, and placed at EADS to qualify Ariane 5 on-board flight software".