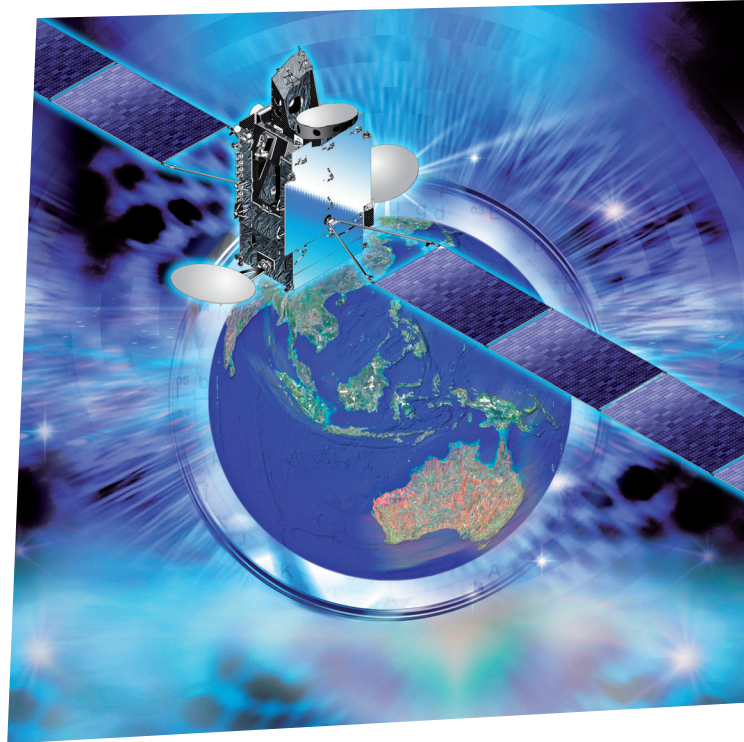


Space Systems Engineering

Accredited by the Conférence des Grandes Écoles



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

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 have to conduct a professional thesis in aerospace industry or in laboratory, in France or abroad, 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

Part 1 - Missions and Systems - 140 h

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

Part 2 - Space projects environment - 120 h

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

Part 3 - Satellites and Systems - 150 h

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

Part 4 - Conferences and seminars

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

Part 0 - Harmonisation

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

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, Seditec, Snecma Groupe, Transiciel, Astek, Sagem, Thales Alenia Space, Esa, Inpe (Brazil), Instituto Mexicano de Comunicaciones (Mexico).

Witness

Mireia JOYA – Spain, SM TAS ASTRO graduated 2010

«The great quality of the ISAE's master has helped me to shape my future the way I imagined. It has been a unique learning experience not only because of the numerous lecturers from different areas of the Space Industry we had but also because it brought me the opportunity to participate in a very interesting project at EADS Astrium. I will always remember with great pleasure the friendship I made with students from all over the world. After the master graduation I joined ALTRAN Toulouse as space thermal engineer».