**Objectives**

The first objective of this program is to give students a broad understanding of space systems and their environment, constraints and capacities in the fields of earth observation, communications and navigation.

The second objective of the program is to help students, using real-life examples and experimental work, to grasp the value of space systems for the creation of space applications and services. Students will propose and design tools and solutions in areas such as the environment, agriculture, transport or urban planning. They will be able to specify a complete telecommunications system according to user needs: Internet access, Internet of Things, fixed or mobile terminals ...

Students will be able to both better understand the performance of space systems and identify user needs, as well as develop new services and applications. The know-how in the digital domain have a central place in the training with topics like big data, cloud computing, digital communications, software radio.

**Organization**

**Head of program**
- Prof. José RADZIK
  jose.radzik@isae-supaoero.fr

**Course duration**
- One year full time: 6 months of courses and 6 months of professional thesis or internship.

**Course start date**
- End of September

**Location**
- ISAE-SUPAERO Toulouse

**Teaching language**
- English

**Syllabus**

**Part 1: Space systems - 43 h**
- Space systems introduction

**Part 2: Digital techniques - 59 h**
- Big data and cloud – Digital communication and networking basics

**Part 3: Earth observation - 100 h**
- Remote sensing and sensors – Image processing and data analysis – Earth observation applications and services

**Part 4: Navigation and positioning - 22 h**
- Navigation and positioning

**Part 5: Space Communications - 111 h**
- Telecommunications and networks - Broadband satellite communication systems - Satellite broadcasting - Telecommunication satellites for mobiles - Satellite communication business

**Part 6: Space economics, regulations & services - 46 h**
- Space economics and regulations - Services and integrated applications

**Part 7: Tutored project - 80h**

**Learning approach**

First semester: 6 months of courses delivered in Toulouse, mainly at ISAE-SUPAERO

Second semester: mission to be completed in a laboratory, an SME, in large companies.

**Company internship, professional thesis:**
- Students have to conduct a professional thesis or make an internship in an industry or in a laboratory, in France or abroad, supervised by a tutor from the host organization and from ISAE-SUPAERO. The thesis is concluded by the preparation of a report and an oral dissertation in front of a jury.

Overseen by an academic advisor and in-company tutor, the project entails the acquisition and development of knowledge and skills within a professional framework.

The subject, which must be approved by the academic advisor and the Director of the Advanced Masters programs, must:
- Give the student the opportunity to prepare for professional activities targeted by the program,
- Be a genuine issue of concern to experts working in the field.
- Must be related to the needs of companies in activity sectors covered by the program.

Students who have already acquired professional experience prior to the program, may complete their project in a research center or laboratory.

**Career opportunities**

This Advanced Master degree offers career opportunities in a wide range of fields:

- Jobs related to cross disciplinary use of space data (observation of the earth and its atmosphere, telecommunications, data positioning, data from scientific missions and exploration) in complex information systems,
- Consulting jobs to identify and define requirements, and implement application solutions using space data,
- New jobs related to new space challenges.

The Advanced Master «Space Applications and Services» guarantees a high level of expertise required for today’s and tomorrow’s international space-related jobs.

Program graduates go on to work as Project Leaders, Business Engineers, Business Development Managers, Consulting Managers, Research Engineers, Expert in Space Applications.

**Companies recruiting our students**
- Thales Alenia Space, Airbus, CNES, SES ASTRA, AKKA Technologies
Testimonies

Why did you choose ISAE-SUPAERO and apply for this MS? What were your objectives?

JULIE AUTULY
Graduated in 2018
Digital Transformation Office Oceania - Airbus

I choose ISAE because it is a well-known engineering school around the world and the MS SPAPS offered both a general space education and an openness to the world and its current challenges, through space applications.

ROMAIN BOULAISSINOU
Cohort 2019

I decided to apply for the Space Applications and Services Advanced Master – SPAPS, because of its tight links with companies (and mainly with Airbus). Moreover, in a reconversion context, my main objectives were to integrate a training within which practice was prevailing and which would increase my employability in the space field.

According to your experience, which are the strong assets of the Master?

JULIE AUTULY

The strong assets are its close connexion to industry, the teaching quality and the enthousiasm its subject drives.

ROMAIN BOULAISSINOU

The strong assets of this training are not only its tight links with companies, as mentioned above, but also the diversity of modules offered: remote sensing, signal treatment, image processing, machine learning, telecommunications and broadcasting. I have been provided with a wide knowledge being confronted with main space applications issues. This was a unique opportunity to use these new skills in the appropriate context.

Which are your career plans?

JULIE AUTULY

I will be finishing my one-year contract at ESA by the end of October. Nothing is settled yet, but I might go on with a VIE, still in the aerospace sector.

ROMAIN BOULAISSINOU

I plan to become an IMINT (Imagery INTelligence) or GEOINT (GEOspatial INTelligence) engineer.
**Admission procedures**

**Advanced Masters**

**Academic requirements**
A master’s degree, or an equivalent degree in science or engineering (or in management for advanced masters in management), or bachelor degree completed by 3 years of professional experience

Tuition fees: see our website


**Selection and admission**

Selection and admission are made by an admission committee. Possible interviews can be organized if necessary

Deadlines for application:
Several admission committees scheduled from January to July, see schedule on our website

**Language requirements for Masters in French**

Language qualification requested
Score B2-Common - European Framework of Reference for Languages

Application website:

**Language requirements for Masters in English**

TOEFL (IBT) or TOEIC or IELTS or CAE/FCE

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NOTA BENE: Volume of teaching hours and contents of the programs are provided for information only and are subject to change.

**Funding**
Information on tuitions fees and funding can be found on our website


**Your contacts**

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