Space Applications and Services
WITH AIRBUS DEFENCE & SPACE

Objectives
The first objective of this program is to give students a broad understanding of space systems and how they are used in the fields of Earth’s environment monitoring, communications and navigation.
The second objective of the program is to train students to the design of space applications and services by using real-life examples and experimental work.
Students will propose and design tools and solutions in areas such as the Earth's environment, agriculture, transport or urban planning.
Thanks to their understanding of the constraints and performances of space systems, students will be able to develop new applications and services from the user needs.
The know-how in the digital domain has a central place in the training with lessons and pratical applications in signal and image processing, machine learning, big data, cloud computing, digital communications, software radio.

Organization
Head of program
• Prof. Raphaël Garcia
Raphael.Garcia@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
Machine learning, Big data and cloud ...

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 a 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 and applications...
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 AUTUY
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 BOULAIS SINOU
Graduated in 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?

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

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?

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.

I plan to become an IMINT (IMagery INtelligence) or GEIOINT (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

■ LANGUAGE REQUIREMENTS
FOR ALL MASTERS

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.

■ SELECTION AND ADMISSION

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

Deadlines for application:
Applications open in October 2020 for intake in September 2021.
Several admission committees scheduled from January to July, see schedule on our website

Application website :

■ LANGUAGE REQUIREMENTS
FOR MASTERS IN FRENCH

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

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

■ Your contacts

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