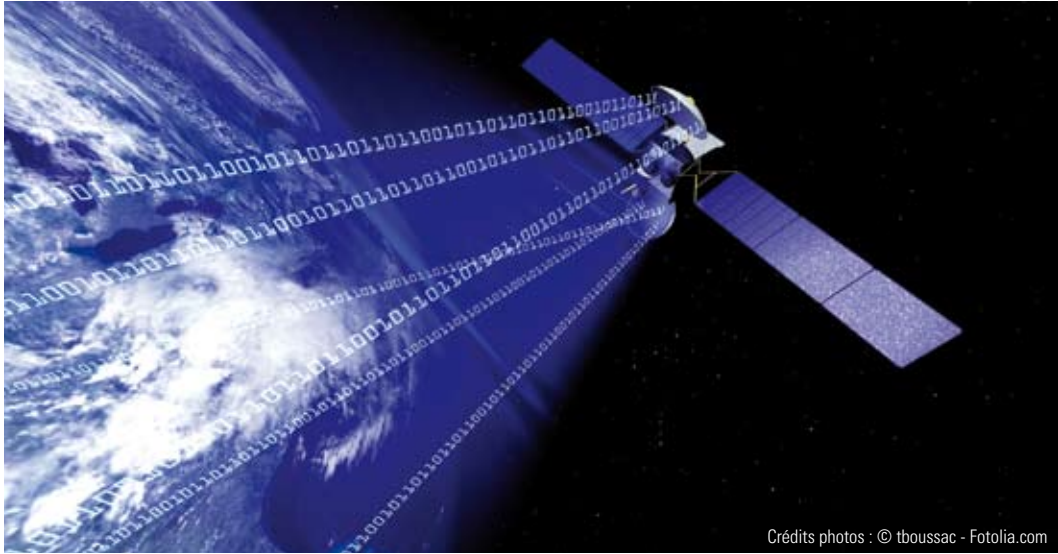


Space Communications Systems (ISAE, ENSEEIHT, TELECOM Bretagne, TELECOM SudParis)

Accredited by the Conférence des Grandes Écoles



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Aims

Since fifty years, satellite systems have demonstrated their excellence to collect and distribute data in a vast coverage area for the benefit of thousands of users. While space communication is a niche market within the global telecommunications business, it displays one of the most profitable space applications in permanent evolution. Companies of the sector, both system and service providers, are constantly looking for junior executives offering the expertise matching the specifics of space communication.

The Space Communication Systems programme is tailored to provide students with necessary and up-to-date knowledge for mastering different aspects of digital communications, signal processing, and networking applied to communication or navigation systems. Such systems are strategic in aeronautical or space applications.

The programmes builds upon on the following principles:

- give a global approach of system design and analysis by taking into account the environments, the limitations and the constraints, the interfaces and the expected performances,

- develop expertise in the disciplines contributing to the design of these systems: signal processing, digital communications, networking, etc.
- acquire and master design and simulation tools and techniques of the field,
- get acquainted with the development of applications for the space, aeronautical and embedded-system domains

Organization

Heads of Program:

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Duration of studies: one year full time

Beginning of classes: September

Location: ISAE, Campus SUPAERO and ENSEEIHT

Industrial Scholarships

THALES has selected the Specialized Master Space Communications Systems for its **THALES Academia** program: a partnership between Thales group, leading French engineering and business schools and the Ministry of Foreign Affairs. Every year scholarships are offered to students from **Brazil, China, India and Russia**.
www.thalesgroup.com/extra/academia/index_en.htm

Pedagogical approach

First semester: academic session of around 400h, provided by ENSEEIHT, TELECOM Bretagne and ISAE's permanent professors and experts from aerospace industry bringing current knowledge and experience, including:

- lectures, tutorials, experimental and practical sessions, online exercises, practical works in team, simulation with MATLAB, OPNET, or specific software,
- 3 projects carried out in pairs for about 100 hours globally,
- conferences, demonstrations in laboratory, experimentations on links, navigation receivers (GPS, etc.).

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

Syllabus

Part 1 - Project management - 20 h

Part 2 - Basics - 159 h

Signal processing and source coding, Digital communications, Spread spectrum techniques, Coding applied to the satellite channel, Basics on networks, Network simulation tools, Antennas and microwaves components, Integrated electronics, Project

Part 3 - Systems and specific techniques - 182 h

Orbits and satellites platforms, Radiofrequency links and propagation, Space communications systems, Navigation and localization systems by satel-

lite, Communication and navigation satellite payload, Digital filters and processing, Communications digital receivers, Navigation digital receivers, Ground stations and terminals, Project

Part 4 - Applications - 140 h

Satellite based computer networks, Embedded-networks, Mobile communications and multimedia
Legal and economic aspects, Overview of space systems applications, Integrated Team Project

Career opportunities

This Specialized Master in space communications systems offers students various junior executive positions in systems design leading to the management of projects in navigation and communications space systems sectors.

Companies recruiting our students

- Electronics and telecommunications companies: Alcatel, EADS, Thales, Safran, St Micro
- Communications operators: Eutelsat, Hispasat, Société Européenne de Satellites, Telespazio
- Space agencies and research centers: CNES, DSN, DLR, ESA, Algerian Space Agency
- Consulting groups: M3 Systems, Altran, France Développement Conseil, etc.

Witness

Interview Nacima RACHEDI, Engineer, Algerian Space Agency, Graduated in 2009

"ISAE is for me a famous school where state of art of the space technologies are taught. Knowing that I am planning to build my carrier in that field, it was for me a good opportunity to do my master in this environment. If I can make advice for future students, my first advice is to be able to learn new things, new methods, new skies, never stay in it's own vision, doesn't matter where we are coming from and which school mechanism we use to follow. After that it's question of ambition and willing. This master courses were for me a huge amount of information and methodologies, I gained knowledge that can help me in my work but also touching closely all the modules and doing workshops. I had some experiences that I am sure it will allow me to look further in that field next time when I have to implement some topics during my carrier. After graduation, I will come back home and be appointed as project officer in the Algerian Space Agency".

Admission 2010

Common ISAE's admission procedures

Postgraduate Specialized Masters in engineering

- **SM AMS - SM ASAA - SM EMS - SM HE - SM SCS - SM SEN - SM TAS Aero - SM TAS Astro**
- **MS EAS - MS SAS - MS SPA**

Tuition fees 2010-2011: 12 000 €.

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

Academic requirements

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

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 April to June 2010,

Application form to be downloaded at www.isae.fr

Application fees: 65 € (non-refundable).

Complete application files 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

Language requirements for Masters in English

Language qualification 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.

Other admission procedures

MS IEVex

Specific admission process through the French Ministry of Defence, contact us for more detailed information.

MS MGP

Selection and admission organized by HEC:

www.hec.edu/Specialized-Masters

Contact us for more detailed information.

MS IMF

Selection and admission organized by ESC Toulouse:

www.esc-toulouse.com

Contact us for more detailed information.

Contacts

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ISAE

The "Institut Supérieur de l'Aéronautique et de l'Espace" (ISAE) was created in 2007 from the merger of the two prestigious French graduate and postgraduate schools of engineering, SUPAERO and ENSICA. Today, ISAE, is a world-class higher institute for aerospace engineering education and research. Nowadays with a student corpus of over 1600, ISAE is one of Europe's largest Aerospace Institute offering graduates and postgraduates programs. Yearly, ISAE awards around 20% of master's degrees in Europe in aeronautics and space field. ISAE develops its worldwide reputation on the prestige of its master's programs, the fame of its teaching staff, or the excellence of its research but also on the high-value of its graduates, their skills in engineering or management, as well, their capacity to evolve within a very high-technology environment, their enterprising mind and international opening.

Identity card

Name: Institut Supérieur de l'Aéronautique et de l'Espace (ISAE)

Founded in 2007 - as the result of the merging of SUPAERO (1909) and ENSICA (1945)

Legal Status: A large public institution of scientific, cultural and vocational missions

Trustees: Délégation Générale pour l'Armement (DGA) [French Defence Procurement] - Ministry of Defense

Endorsements and awards: CTI agreement of the two Graduate Programs, Conference des 'Grandes Écoles', for postgraduate specialized masters Ministry of Higher Education and Research for Masters of Science

Staff: 420 permanent staff

Key figures

2 Graduate Programs: SUPAERO and ENSICA

17 Specialized Masters including 12 in English

2 Masters of Science

9 Research Masters

6 PhD Programs

1600 students

160 international cooperation opportunities

50 academic and research partnerships

Contacts ISAE

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