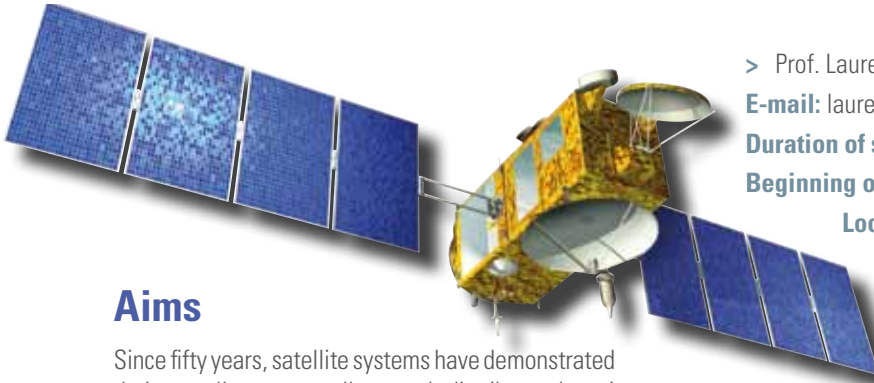


Space Communication Systems (ISAE, ENSEEIHT, Télécom Bretagne, TELECOM SudParis)

MS SCS



> Prof. Laurent FRANCK

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Duration of studies: One year full time

Beginning of classes: September

Location: Toulouse: ISAE, Campus SUPAERO and ENSEEIHT

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. Within the global telecommunications industry, space communications display one of the most profitable businesses 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 communications.

The Space Communication Systems program 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 program, is built upon on the following foundations:

- > 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.
- > to acquire and master design methods, simulation tools and field techniques,
- > get acquainted with the development of applications for the space, aeronautical and embedded-system domains.

Organization

Heads of Program:

> Prof. Marie-Laure BOUCHERET

E-mail: marie-laure.boucheret@enseeiht.fr

> Prof. Michel BOUSQUET

E-mail: michel.bousquet@isae.fr

Pedagogical approach

First semester: academic session of around 500 hours, provided by ENSEEIHT, Télécom Bretagne and ISAE's permanent professors and experts from the 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 have to conduct a professional thesis in the aerospace Industry or in a laboratory, in France or abroad, supervised by a tutor from the host organisation and from ISAE, ENSEEIHT or Télécom Bretagne. The thesis is concluded by the preparation of a report and a public defense.

Syllabus

Part 1 - Project management - 21 h

Part 2 - Basics - 181 h

Signal processing, Digital communications, Spread spectrum techniques, Coding applied to the satellite channel, Network & telecommunication protocols, Simulation of networks, Antennas and microwaves, Simulation of communication systems

Part 3 - Space and specific techniques - 196 h

Orbits and platforms, Propagation & Radiofrequency links, Space communications systems, Satellite geographical positioning and navigation systems, Payload, Earth station, Digital filters, Digital communications receivers, Digital navigation receivers, Project

Part 4 - Applications - 136 h

Satellite based computer networks, Embedded systems, multimedia communications, mobile communications, Financial applications, Project

Career opportunities

This Advanced 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, SES, Telespazio

Space agencies and research centers: CNES, DSN, DLR, ESA, Algerian Space Agency

Consulting groups: M3 Systems, Altran, France Developpement Conseil, etc.

TESTIMONIES

Chunbang WU, China, Engineer, CAST, Graduated in 2011

*Why did you choose ISAE and apply for our master ?
What were your objectives ?*

ISAE is well known in aeronautic and aerospace field all over the world. It is CAST (China academy of space technology) recommends me choosing this school and applying for Advanced Master. My objectives were to improve my basic theory in Space Communication System and to enhance the tight friendship with European company.

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

In my study period, the deepest impression is that teachers have broad and profound knowledge, strong system concept and accurate logic, such as Professor Michel Bousquet. He provided many chances to visit the well-known aerospace company and communicate with the experts.

Which are your career plans ?

After going back to China, I will continue my work in CAST. I will use my knowledge learned from ISAE to the aerospace program of China. I will become a general designer of satellite system.

VENMANI Daniel Philip, India, Graduated in 2010

France, a land of Fashion and food, the land of TGV, is superior in its technology also. And that is the prime reason I opted for France as a destination to do my Masters Studies. France, being one of the leaders in wireless communications with Satellite Communications and Telecommunications, bearing major concerns like the EADS, Thales attracted me to pursue my Masters in Space Communication Systems.

And, to its credit, ISAE is the best place to begin a career in communications, where in numerous research works are being carried out in domains like Ad-Hoc networks, Wireless Networks, Resource Allocation for satellite links, Radio engineering for satellite systems etc.

ISAE, best known for its exclusive training for engineers in the field of Aeronautical Engineering, is no way inferior for Satellite communications as well. Best professors like Marie Laure Boucheret, Michel Bousquet, Laurent Franck are all known for excellent academic and research accomplishments in their respective field. World class Labs that are opened throughout the day, easy access to libraries and above all always-smiling and most willingly helpful staff will make the stay more pleasant.

In short, I could conclude that «ISAE- Not so foreign!» to me, as I have all my motherland feelings inherited in it while studying there! Today, I find myself as a Doctoral Candidate with Orange Labs, thanks to ISAE!

Common ISAE's admission procedures

Advanced Masters

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.

Tuition fees 2014:

	EU		Out of EU	
	reduced tuition fees ¹	tuition fees	reduced tuition fees ²	tuition fees ³
SCS	6 500 €	12 500 €	12 500 €	18 000 €

¹ for students graduated in the year of enrollment or the year before and with no professional experience

² for individual applicants

³ fees for public agencies and private companies available upon request from Philippe Galaup at: philippe.galaup@isae.fr, Head of recruitment and Contractual Relations

Possibility of studies funding by the Midi-Pyrénées Regional Council for French and UE unemployed applicants.

Selection and admission

Admission to ISAE's master at:

<http://admissionsmasters.isae.fr>

Selection and admission are made by an admission committee:

> possible interviews can be organized if necessary

Deadlines for application:

> several admission committees scheduled from February to July 2014, see schedule on our website: www.isae.fr

Application fees:

> 67 € (non-refundable)

Language requirements

Language qualification requested:

- > TOEFL (Paper-based): 550,
- > TOEFL (IBT): 79,
- > TOEIC: 750,
- > IELTS: 6.0,
- > CAE Cambridge, ...

Your contacts at ISAE

- > **Philippe GALAUP**, Head of recruitment and Contractual Relations - Phone : +33 (5) 61 33 80 27
- > **Laurence BALLARIN**, Senior Admission Advisor - Phone : +33 (5) 61 33 80 22
- > **Marie GUIBBAL**, Senior Admission Advisor - Phone : +33 (5) 61 33 80 28

info-masters@isae.fr

ISAE in few words

The "Institut Supérieur de l'Aéronautique et de l'Espace" (ISAE) was created in 2007 from the merger of the two prestigious French 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 1500, 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.

Key figures

- > 2 Graduate Engineering Programs: SUPAERO and ENSICA
- > 15 Advanced Masters including 10 in English
- > 3 Masters of Science
- > 5 Research Masters
- > 6 PhD Programs
- > 1500 students (1300 masters and 200 PhDs more or less)
- > 160 international cooperation opportunities

50 academic and research partnerships



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: Public Institution of higher education and research

Trustees: Direction Générale de 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 Advanced Masters and "Ministry of Higher Education and Research" for Masters of Science

Staff: 420 permanent staff

Two campuses close to all conveniences

The two campuses are located in the very heart of Toulouse. This means that students can very easily balance studies, social life, sports and leisure activities from day to day.

The SUPAERO campus

- > Nearly 1,000 students on a 22-hectare campus that runs alongside the Canal du Midi,
- > extensive sports facilities: swimming pool, tennis courts, squash courts, gymnasium, sports pitches, climbing wall; the banks of the Canal du Midi are just a short stroll away,
- > student residences: 500 places on the campus; on-site catering.

The ENSICA campus

- > Located close to the centre of Toulouse and accessible in less than five minutes by metro,
- > nearly 500 students on an eight-hectare campus,
- > extensive sports facilities: tennis courts, gymnasium, sports pitches; the banks of the Canal du Midi are just a short stroll away,
- > student residences: more than 350 places on the campus; on-site catering.