

# System Engineering

Accredited by the Conférence des Grandes Écoles

*The ISAE's Masters programs benefit of the strong connections with the aerospace and defence industries, as well as automobile, energy, etc. developed over the past 100 years by SUPAERO and ENSICA merged under a unique Institute in 2007.*

## Aims

Systems Engineering is an interdisciplinary field of engineering integrating all disciplines and technologies into integrated team from development, to design, up to operation and disposal of competitive and complex systems.

Systems Engineering approach is the capacity to federate and control various, interweaving and complementary engineering activities. This approach goal is to deliver satisfying systems, on-time, within expecting budget, with the level of quality and performances meeting requirements of an open and competitive market. System Engineering Process implements technical processes (requirement engineering, design, integration, verification, validation, etc.) as well as project management processes, agreement processes and enterprise processes.

The Systems Engineering Master degree program is a one-year professional course of study, designed in partnership with the industry. This program aims at providing worldwide industry with skilled professionals in System Engineering able to specify, design, deploy and maintain competitive and complex systems, fit to purpose, in various industrial sectors: space, aeronautics, air traffic control, land transport systems, maritime transport, health industry, energy, communication systems, etc.

## Organization

### Head of Program

Prof. Jean-Luc WIPPLER

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**Duration of studies:** One year full time

**Beginning of classes:** September

**Location:** ISAE, Campus SUPAERO

**Teaching language:** English

## Pedagogical approach

The one-year course is split into 2 quarters in ISAE premises - lectures, integrated team project, etc. - and 4-5 months of internship.

**First semester:** academic session of around 440h, provided by ISAE's permanent professors and experts from industry bringing current knowledge and experience, including: Lectures, tutorials, industrial study cases. And 130h devoted to the Integrated Team Project run all along the semester.

**Second semester:** students conduct a professional thesis within an aeronautical industry or organisation, in France or abroad and 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

System Engineering Introduction – Project Technical Management – System Engineering Data Technical Management – System Modelling and Analysis – System Dependability – System Performance Assessment and Management – Optimise, Decide, Justify, Verify & Validate – Requirement Engineering – System Design and Architecture – System Assembly, System Integration, System Verification & System – Validation – Integrated Logistics Support – System of Systems – System Engineering & Certification of the A380 – System Engineering of Space based Systems – Integrated Team Project

## Who can apply?

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



## How to apply?

- Through application file, to be downloaded at [www.isae.fr](http://www.isae.fr).
- Selection is made upon the study of the application file, possible interviews can be organized if necessary.
- Deadlines for application: from April to July 2009.
- Application fees: 65 € (non-refundable).
- Applications have 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

## English proficiency

Adequate command of spoken and written English is required for admission.

Language qualification is 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.

## Tuition fees in 2009-2010: 12 000 €.

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

Dates: sept. 2009 - sept. 2010.

## Contact information

- Michel CHAUVIN, Deputy Director of Masters Programs: [michel.chauvin@isae.fr](mailto:michel.chauvin@isae.fr)
- Marie JENTET, Information and Marketing Manager: [marie.jentet@isae.fr](mailto:marie.jentet@isae.fr)
- Web: [www.isae.fr](http://www.isae.fr)

## Industrial Partnerships

THALES has selected the Specialized Master Embedded 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](http://www.thalesgroup.com/extra/academia/index_en.htm)

## Career opportunities

For Students with open mind, who want to Master things generally, who do like working in integrated team, who like challenges, who are convinced that we can have fun while working, this Master will offer huge job opportunities in Systems Engineering.

Systems Engineering is now a real and permanent concern for any business players, from Major Governmental contractors, to equipment manufacturers, to prime contractor integrating systems, and services companies such as Airlines for instance.

## Systems Engineering jobs are characterized by many disciplines:

- multidisciplinary - mechanics, electronics, information technology, etc,
- strong interface with project management,
- permanent concerns all along the life cycle of a system.

Need of Systems Engineering engineers is increasing for both industries developing, producing and maintaining large complex systems (aircraft, ships, military and defence systems, cars, etc.) and other industries developing and producing smaller high technology products (cameras, mobile phones, printers, computers, etc.). This Master program offer students great opportunity to join Engineering Systems Team within industries in different economic sectors.

## Companies recruiting our students

EADS Airbus, Dassault Aviation, EADS Defence and Security System, EADS Astrium, Arianespace, Aéroconseil, Seditec, Altran, Hispano Suiza.

## Witnesses

### Two questions to an employer Lionel MICHAUD

A-UAV Airborne Mission System Technical Manager  
EADS Defense & Security Military Air Systems

*For what reasons do you appreciate the candidates of the Systems Engineering Specialized Master's degree?*

"At EADS, we appreciate these students because Systems Engineering is in the heart of our prime contractor business. This Master of ISAE (ex SUPAERO) complies with huge and real needs of prime contractors in aerospace sector but not only, as nuclear industry for instance".

*What are the expected jobs for student graduated with system engineering Master of ISAE?*

"At EADS, the most typical position after graduation is Systems Engineering engineers, with a rapid evolution toward technical project manager and then project manager. This Master is to be considered as a career booster toward these jobs in contrast with more generalist profile".

### Interview, Dorothée CHARLES, Graduated in 2006, advanced-UAV System Engineer

"I chose to perform the SEN Master of ISAE (SUPAERO) because I knew that it will train people to be very quickly operational in an industrial companies and I was right. Most of our teachers came from the industrial world and trained us with pragmatic methodologies and issues. Now, I lead all the Tools and Processes activities on a European military project for EADS Defence and Security called Advanced-UAV. I'm sure I would not have been capable of performing these activities so quickly without this Master".