



# SYSTEMS ENGINEERING

ADVANCED MASTER

## ONE YEAR FULL TIME

- 6 months of courses.
- 6 months of professional thesis or internship.

## TEACHING LANGUAGE

- English

## START OF CLASSES

- End of September

## LOCATION

- ISAE-SUPAERO, Toulouse, France

## KEY POINTS

- RNCP Certified - Several funding possibilities.
- INCOSE Certification preparation (optional).

## HEAD OF PROGRAM

- ISAE-SUPAERO:  
Prof. Jean-Charles CHAUDEMAR  
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## PRE-REQUISITES

- A Master's Degree or an equivalent degree in science
- Or a Bachelor's Degree with at least 3 years of professional experience
- International degree equivalent to the aforementioned degrees.
- These programs can also be accessed from 5 years of professional experience (VAPP)
- the Validation of prior learning and experience - VAE

## CONTACT

- Young graduates with less than 1 year of professional experience:  
[info-programmes@isae-supaero.fr](mailto:info-programmes@isae-supaero.fr)
- Experienced professionals:  
[info.exed@isae-supaero.fr](mailto:info.exed@isae-supaero.fr)
- People with disabilities, assistance is available at  
[laurence.ballarin@isae-supaero.fr](mailto:laurence.ballarin@isae-supaero.fr)



- The **Advanced Master's®** degree Systems Engineering accredited by the Conférence des Grandes Ecoles (under number 521)
- The «**Architecte-Manager en ingénierie système**» (Architect - Manager in Systems Engineering) professional certification registered with the RNCP (National Directory of Professional Certification) under number 41 130

## OBJECTIVES

Systems Engineering is an interdisciplinary engineering discipline combining all sciences and technologies in an integrated team from design, to development, up to operations and delivery of competitive and complex systems.

The systems Engineering approach is the capacity to federate and control various, interweaving and complementary engineering activities. The objective of this approach is to deliver satisfactory systems, on-time and within the projected budget, with the level of quality and performances that meets the requirements of an open and competitive market.

The systems Engineering process implements technical processes (requirement engineering, design, integration, verification, validation, etc.) as well as project management processes, agreement processes and enterprise processes.

The program is designed in partnership with industry. Graduates are 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

## LEARNING APPROACH

**1<sup>st</sup> semester:** academic session of around 500 h, provided by ISAE-SUPAERO's tenured professors and experts from industry bringing current knowledge and experience, including:

- lectures, tutorials
- industrial study cases.

40 hours on average devoted to the coaching of the Integrated Team Project run throughout the semester.

**2<sup>nd</sup> semester:** students are required to conduct a 4 to 6 months professional thesis or 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 concludes with the submission of a report and an oral dissertation in front of a jury.

## CAREER OPPORTUNITIES

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

Systems Engineering positions embrace numerous disciplines:

- multidisciplinary - mechanics, electronics, information technology...
- strong interface with project management,
- The need for Systems Architects 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.).

### Companies recruiting our students

Safran, CAST, Luxembourg Space Telecommunication, Dassault Aviation, Airbus Group and its subsidiaries, EGIS Avia, Arianespace, ALTEN, AKKA, Seditec, Safran Transmission Systems, Thales Alenia Space, INPE (Brazil), AVIC (China), COMAC (China), Thales China, Geo-Informatics and Space Technology Development Agency (Thailand)...



< [More information](#)



## SYLLABUS



## Part 1: Outlines, topics and Fundamentals

- Systems Engineering Introduction
- Introduction to Space Systems
- Project Management Introduction
- Introduction to verification & validation

## Part 2: Roles: processes and Specialities

- Requirements engineering, Systems modelling and Analysis
- Integrated Logistic Support, Project Technical Management
- Systems design and architecture

## Part 3: Deployment, methods &amp; tools

- Systems Engineering Data Technical Management
- «Optimise, decide, justify, & Validate»
- Systems Dependability

## Part 4: Industrial applications, study cases

- Airbus: Systems Engineering & Certification of the A350
- Dassault: Systems Engineering at Dassault Aviation
- DGA: System of systems (systems engineering methods and tools, introduction to space system)

## Part 5: Integrated Team Project

## INCOSE certification in ISAE-SUPAERO

At the end of the first semester, all SEN students are encouraged to participate in a one-month complementary program in preparation for ASEP\* level of INCOSE (International Council on System Engineering) certification. INCOSE certification consists of an exam which is of internationally recognized value to validate knowledge and skills in systems engineering.

## TESTIMONIES

## TREVOR DE SOUZA

Class of 2021-2022



ISAE-SUPAERO has a strong reputation in the aeronautical domain for excellence and has partnerships with the major actors/players. First experience/introduction to the space domain.

**The System Engineering methodology is spreading quickly across many domains, and has a high recruitment potential.**

Gain knowledge/competencies and complete a Masters in a French/European working environment. Capitalize on the lack of work during the Covid period to re-skill and improve. Explore other domains that share common engineering skills.



I was looking to further my education with the aim of gaining employment in the aerospace sector. Due to my 8 years of diverse work experience and the phase of life my wife and I were in, I was not able to commit to a two year study program, with minimal to no income, so I needed to find an accelerated program that would still allow me to achieve a well recognized degree. I was so pleased to find the advanced master program at Supaero that met these requirements.

Further to being perfect in terms of study duration, I sincerely appreciated the strong links to industry throughout the course. Almost all the lecturers were directly from industry, providing us with really practical instruction. **Supaero is highly regarded in the industry, which made finding work much easier than it was before.**

## GARETH JONES

Class of 2021-2022