



Systems Engineering

■ Objectives

Systems Engineering is an interdisciplinary discipline of engineering combining all sciences and technologies into integrated team from design, to development, up to operations 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 expected budget, with the level of quality and performances meeting requirements of an open and competitive market. 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 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 Systems 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-Charles CHAUDEMAR
jean-charles.chaudemar@isae-supaero.fr

Course duration

One year full time

Course start date

September

Location

- ISAE-SUPAERO

Teaching language

English

■ Learning approach

First semester: academic session of around 500 h, provided by ISAE-SUPAERO's permanent professors and experts from industry bringing current knowledge and experience, including: lectures, tutorials, industrial study cases. And 45h devoted to the coaching of the Integrated Team Project run all along the semester.

Second semester: students have to conduct a professional thesis in aerospace industry or in 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 jury.

■ Syllabus

Teaching part (First semester)

Part 1: Academics

Systems Engineering Introduction – Project Management
Introduction Project Technical Management – Systems Engineering
Data Technical Management Systems Modelling and Analysis
– Systems Dependability – Systems Performance Assessment
& Management Optimise, Decide, Justify, Verify & Validate
Requirements Engineering – Systems Design and Architecture
Introduction to Verification & Validation Integrated Logistic Support
– Airbus Study Case: Systems Engineering & Certification of the
A380 – Systems Engineering of Space Systems – DASSAULT Study
Case: Systems Engineering at Dassault aviation – DGA Study
Case: System of Systems (Systems Engineering Methods and tools
Introduction to Space System

Part 2: Integrated Team Project (ITP) 45 h of coaching

■ Career opportunities

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 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.). This Master program offers students great opportunity to join Engineering Team Systems within industries in different economic sectors.

Companies recruiting our students

Altran, Dassault Aviation, Airbus Group and its subsidiaries, EGIS Avia, Arianespace, ALTEN, AKKA, Seditec, Hispano Suiza, Thales Alenia Space, INPE (Brazil), AVIC (China), COMAC (China), Thales China, Geo-Informatics and Space Technology Development Agency (Thailand).

INCOSE

INCOSE certification in ISAE-SUPAERO

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

*Associate Systems Engineering Professional



Testimonies

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

For me, ISAE-SUPAERO is one of the best institutes in the world to produce world class engineers discovered with high end technologies taught by experts from globally renowned companies and institutes. Basically I am a Mechanical Engineer specialized in Thermal Engineering. I have been working in Aircraft Mechanical Systems for 6 Years. My initial objective was to capture some specific categories of systems engineering in which I was lagging and not experienced. But, this course gave me an excellent exposure of its theory and its practical applications on different domains. I could also master in the areas in which I was experienced by applying the theory and concepts from the experts.

Having a passionate interest in aerospace and aeronautics, once I heard that ISAE-SUPAERO SUPAERO offered the possibility to get an advanced master degree in Systems Engineering, I jumped in the opportunity for me to enlarge my field of competences.

I knew that with my background in Embedded Systems, given by ENSEIRB-MATMECA Engineering School, it would be interesting to work on larger scale Aerospace systems.

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

The interactive mode of this course which has been taken as the key factor in the syllabus is the real success for this program. In addition, the academic projects from different organizations scaled my versatility in applying systems engineering in different domains. Thanks to Systems Engineering Department for its course structure. The strongest asset is that one can enter into any domain after experiencing this course and its assistance in obtaining INCOSE certification.

The master offers to work closely with the industrial world. Thus, the student is involved in the real work dealt day to day in high tech and worldwide leader companies.

Hence, once you arrive in your internship or your real job place, you are rapidly operational.

Which are your career plans?

Currently, I am doing my Internship at Airbus, Hamburg. I would like to have a title as "Systems Engineering Expert" in my business card after 5 years from now.

MAHESH MADHAVAN-NAIR
India, SAFRAN Engineering, Graduated in 2013

I am currently working on Critical Software dedicated to navigation at the crossroad of Space and Aeronautics and I learn a lot. This would be a stepping board to continue to improve my competences. Then, step by step I hope getting more and more involved in Systems Engineering.

RAPHAËL FLAMEMBAUM
France, Critical Software Engineer at Airbus Space & Defense,

I have been working in AVIC as a Radar System Engineer for 6 years. My reasons for applying to the SEN Advanced Master were to have a systematic view of complex system development and also to practise my experiences.

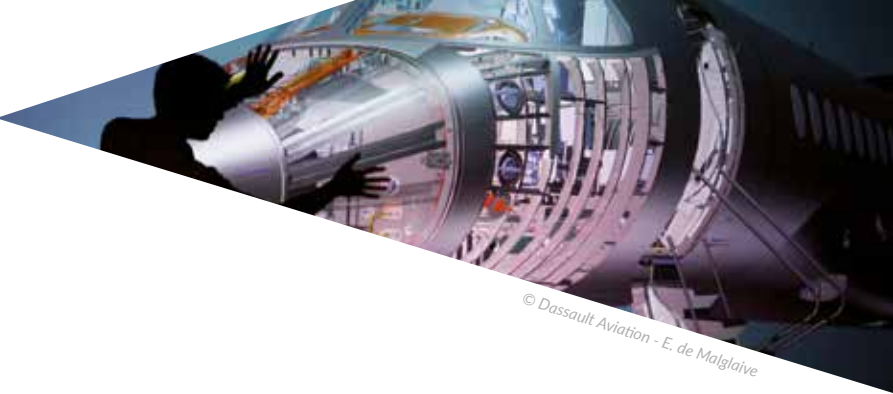
The strengths of SEN are:

- first the knowledge of Systems Engineering. I get a lot of knowledge for the system development, system design, verification and so on. I also increase my capability for analysing and solving problems, especially complex problems.

- then the quality of the education. The professors are very professional. There are professors from industry. So they can give us practical experiments about their job.

- last but not least, the international atmosphere. We can be involved in an international team during the SEN Master program. My plan for the future is to continue the Radar System Engineer (at AVIC) with the new skills that I gained in ISAE-SUPAERO in the Systems Engineering master.

GUOLIANG SUN
China, Graduated in 2012



© Dassault Aviation - E. de Malglaive

■ 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

Application website :

<http://admissionsmasters.isae-supero.fr>

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 January to July, see schedule on our website

Language requirements for Masters in English

TOEFL
(IBT)

or

TOEIC

or

IELTS

or

CAE/FCE



85 points



785 points



6.5 points

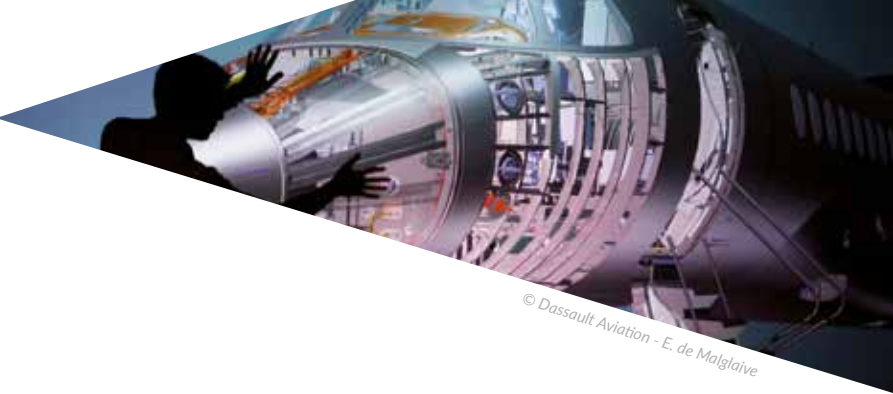


170 points

Language requirements for Masters in French

Language qualification requested

Score B2-Common - European Framework of Reference for Languages



© Dassault Aviation - E. de Malglaive

■ **Your contacts**

Philippe GALAUP,
Head of recruitment and Contractual
Relations
Phone: +33 (5) 61 33 80 27

Catherine DUVAL,
Senior Admission Advisor/Aerospace
sector
Phone: +33 (5) 61 33 80 37

info-master@isae-superaero.fr
www.isae-superaero.fr