

# ADVANCED MASTERS IN AEROSPACE ENGINEERING & MANAGEMENT

*Post-graduate education  
for aeronautics & space · 2024*



**Excellence with passion**



# ISAE-SUPAERO

## A world leader in Aerospace Engineering higher education

### A public institution of higher education and research

We have developed an integrated approach with training, research, and innovation in partnership with academic players, many industrial stakeholders, and a network of the finest international universities.

Our training and research activities have adopted sustainable development targets, participate in reducing air transport's environmental footprint and thus contribute to the transformation of the aeronautics sector.

The high scientific and technical levels of our multidisciplinary programs prepare future generations of engineers and managers for a wide variety of fields in aeronautics and space, as well as other areas such as autonomous systems, Artificial Intelligence (AI), and energetics innovation...

### The ecological transition at the heart of ISAE-SUPAERO's commitment

At ISAE-SUPAERO, we are convinced that Aviation connects people together, that Space is essential for communicating between continents and evaluating the condition of the planet. Both are at the cutting edge of technology, and their progress spills over into many other areas.

This is why we conduct research and train engineers and doctors so they can invent the aeronautics and space of the 21st century, and more generally build the sustainable world of tomorrow.

Aerospace engineers are now taking up a new extraordinary challenge: decarbonizing the aviation sector.

To do so, new air transport systems will have to be invented, combining every aspect of technology and our engineer's creativity.

The mobilization of the Institute in the integration of environmental issues was recognized by a second place in the ChangeNOW ranking of the French engineering schools most committed to the ecological transition.



### A wide range of degrees in aerospace engineering

3 MASTERS PROGRAMS

15 ADVANCED MASTERS PROGRAMS

6 DOCTORAL PROGRAMS (PHD)

17 CERTIFICATES

1922 STUDENTS

35% OF FOREIGN STUDENTS

65 NATIONALITIES ARE PRESENT ON CAMPUS

28000 ALUMNI, AN ACTIVE INTERNATIONAL NETWORK

### A campus located in Toulouse, European Capital of aeronautics and space

Welcome to an exceptional environment in the heart of Toulouse.

Teaching, living and sports facilities – we have it all.

Wide range of sports facilities: pool, a gym, tennis and squash courts, football and rugby fields, rock climbing walls, fitness center...

6 new student residences: 1,000 lodgings, student accommodation and dining hall.

Cutting edge equipment:

- ▶ Autonomous system platform for micro-drones and robots
- ▶ Flight simulators and neuroergonomics platform
- ▶ Wind tunnels, aeroacoustics wind tunnel
- ▶ Satellite command and control center
- ▶ Fleet of 8 Aircraft...



Discover videos of our equipment



The ISAE-SUPAERO Toul'box

A student welcome kit to make life easier right from day one: formalities, setting up a bank account, housing, language courses, cultural activities-find out all you need to know and get started right away!

ISAE-SUPAERO is awarded a ★★★★★ certification which demonstrates the quality of its hosting facilities.

- ▶ Nearly 90000 employees in aeronautics and space, in Occitanie region
- ▶ Toulouse the most attractive university in France



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# 7 REASONS TO CHOOSE an ISAE-SUPAERO Advanced Master's program

The «MASTÈRE SPÉCIALISÉ®» is a collective trademark and label owned by the «Conférence des Grandes Ecoles» or CGE, a network of some of the finest French engineering schools. The highly rigorous accreditation process is a guarantee of program content excellence.

Advanced Master programs, taught in english, are one-year postgraduate courses (6 months of classes and projects, and 6 months of thesis) of professionally-oriented advanced studies.

## 1 Expertise

Increase your expertise in the fields of aeronautics, space, innovation, project management, complex systems, manufacturing, I.A. and digital.

## 2 Management skills

Acquire dual management skills in order to be able to manage teams and manage complex and technical projects.

## 3 Innovation

Expand your knowledge in technology and innovation domains which are at the heart of ISAE-SUPAERO's courses.

## 4 Research

Engage with the most advanced research driving our innovative science and technology curriculum. Six teaching and research departments cover both specialized and multi-disciplinary scientific topics.

## 5 International experience

Acquire international experience in Toulouse, the European aerospace capital. Students and lecturers come from all over the world.

## 6 Professional and alumni network

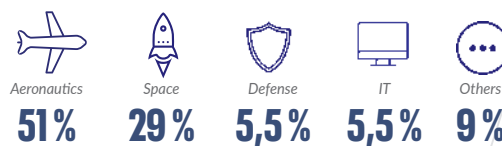
Connect with the ISAE-SUPAERO alumni network of 28 000 graduates worldwide. Benefit from our ongoing partnerships with the leading aerospace companies.

## 7 Exciting career prospects

Get high-level responsibilities in the industry.

## Close-up on the class of 2022

### Business areas



### Job opportunities for our graduates



### Main recruiters



*Make your passion for aerospace engineering a reality  
thanks to our worldclass Masters programs!*





# ADVANCED MASTERS

## MASTÈRE SPÉCIALISÉ®

### SYSTEMS ENGINEERING



#### SEN > Systems ENgineering

RNCP Certified N°36470 - Professional certification « Architecte-Manager en ingénierie système » [Architect - Manager in Systems Engineering (MS)]

##### ■ OBJECTIVES

- ◆ Provide the international aerospace industry with skilled professionals equipped to specify, to design, to deploy and to maintain complex systems.
- ◆ Develop a system approach with the capacity to federate and manage various, interwoven and complementary activities.
- ◆ Prepare systems engineers to work in various industrial sectors including space, aeronautics, air traffic control, land transport systems, etc.

##### ■ CONTENTS

Systems Engineering - Systems Modelling and Analysis - Systems Engineering Data Technical Management - Human factors - Systems Dependability - Systems Performance Assessments & Management - Systems design and Architecture - ILS.

##### ■ CAREER OPPORTUNITIES

Jobs in Engineering Systems Team within industries in different economic sectors, either in major companies or consulting companies in aircraft, ships, military and defense systems, automotive or other industries developing and producing smaller high technology products (cameras, mobile phones, printers, computers, etc.).



////////// ——— DIGITAL ——— //////////



#### AIBT > Artificial Intelligence & Business Transformation

Apprenticeship, initial and executive education

RNCP certified N°35609 « Chef de projets en Intelligence Artificielle et Sciences des données (MS) » [« Artificial Intelligence and Data science Project Manager (MS) »]

##### ■ OBJECTIVES

This Advanced Master is part of the necessary transformation of data valuation, particularly by Artificial Intelligence. This program targets new jobs by offering part-time training for technical managers or high-potential managers.

##### ■ CONTENTS

Project Management, Artificial Intelligence Internals, Business Aspects of Artificial Intelligence, Hands-on practice.

##### ■ CAREER OPPORTUNITIES

Data Evangelist, Project manager in Artificial Intelligence, Manager of data engineers, data analysts, data miners and data scientists etc.

Partner: IRT St Exupéry, TBS education



#### EMS > Embedded Systems

##### ■ OBJECTIVES

- ◆ Prepare embedded systems experts with both system level and functional level design skills.
- ◆ Develop a system approach through integrated projects to master methods & tools used in aeronautics, space and the automotive sector.

##### ■ CONTENTS

Embedded Systems core - Energy - Networks - Embedded Systems design - Embedded Systems applications.

##### ■ CAREER OPPORTUNITIES

Employment as designer, developer, research engineer including project manager in design and development of innovative embedded systems

Partner: INP-ENSEEIH.





## AERONAUTICS



### TAS AERO >

#### Aeronautical Engineering majors Aircraft Design /Flight Test Engineering

##### ■ OBJECTIVES

Have participants develop a high skills level in engineering science, neuro-ergonomics for human factors, current technologies, design and management of aeronautical systems, or flight test methodologies.

##### ■ CONTENTS

Structures and materials - Flight physics - Avionics and systems-Flight test engineering- Aircraft design engineering.

##### ■ CAREER OPPORTUNITIES

Job research engineer, test engineer or design engineer, consultant Sector: Aerospace industry worldwide.



### ASAA > Aviation Safety: Aircraft Airworthiness

##### ■ OBJECTIVES

Give future managers a broad understanding of the issues and priorities in Airworthiness with a focus on air transport safety from design to operations within the international legal environment. This program covers both technical aspects of certification and the legal and economic implications.

##### ■ CONTENTS

Aeronautical techniques and study of aircraft systems - Air Transport safety - Airworthiness.

##### ■ CAREER OPPORTUNITIES

Various job opportunities with aircraft manufacturers, or civil Aviation authorities and airlines: airworthiness inspector, certification manager, Airworthiness follow up, etc.

**Partners:** ENAC, École de l'Air et de l'Espace



ÉCOLE NATIONALE DE L'AVIATION CIVILE



ÉCOLE DE L'AIR  
& DE L'ESPACE

### HADA > Helicopter, Aircraft and Drone Architecture

##### ■ OBJECTIVES

- ◆ Acquisition of the basic skills required for aeronautical engineers (architecture, certification and structures) and specific skills to identify problems, generate alternatives, choose and implement solutions on aircraft, helicopters and drones.
- ◆ Comprehensive training from systems to structures through aerodynamics, flight dynamics and certification while encouraging and taking into account the diversity of the profiles of the selected students.

##### ■ CONTENTS

Aircraft structures, Aircraft architecture and Certification Fixed-wing Aircraft - Helicopter Drone.

##### ■ CAREER OPPORTUNITIES

This program prepares participants for a wide range of professional opportunities from design, certification and operations of civil and military aircrafts, drones and helicopters in France and abroad.

**Partner:** AIRBUS Helicopters

**AIRBUS**

### AMS - E&M >

#### Aeronautical Maintenance and Support- Engineering & Management

##### ■ OBJECTIVES

- ◆ Prepare participants to face the competitive and fast changing MRO business within the international regulatory framework.
- ◆ Expose participants to the latest techniques and methods, regulation and standards applied in the aviation industry.
- ◆ Help participants acquire a wide range of knowledge from engineering fundamentals to maintenance organization management.

##### ■ CONTENTS

Aircraft general familiarization- Maintenance and Support in Aircraft Design - Maintenance & health management analysis & modelling- maintenance execution & management- airworthiness, safety and human factors - Support & services.

##### ■ CAREER OPPORTUNITIES

Management position in aircraft manufacturers, airlines, and MRO organizations in civil or military sectors.

### SPA > Systèmes de Propulsion Aérospatiale

TAUGHT IN FRENCH

##### ■ OBJECTIVES

- ◆ Train propulsion engineers, able to design and operate gas turbines, specialized in internal aerodynamics, with a multidisciplinary knowledge of propulsion systems.
- ◆ Provide with expert knowledge in energetics, fluid dynamics and aerothermodynamics applied to propulsion systems.

##### ■ CONTENTS

Propulsive systems and architectures  
Advanced fluid dynamics, CFD, aeroelasticity and aeroacoustics.  
Turbomachinery aerodynamics and design  
Combustion and multiphase flows.

##### ■ CAREER OPPORTUNITIES

Engineer positions with aerospace engine manufacturers in: design, research and development, and testing facilities. Possibility to pursue with PhD.

### AES > Aeronautical and Space Structures

##### ■ OBJECTIVES

- ◆ Ensure participants acquire an in-depth and multidisciplinary culture in mechanical engineering as applied to structures.
- ◆ Train specialists in design, optimization and certification of structures.
- ◆ Provide expert knowledge in modelling & simulation methods for aircraft and spacecraft structure analysis.

##### ■ CONTENTS

Aerospace structures: methods & tools for engineering dynamics - Aerospace systems architecture - Aerospace structures: dynamics & physics- Aerospace program & technologies.

##### ■ CAREER OPPORTUNITIES

Associate professional in the context of systems design and integration, Manufacturing Process Optimization, systems architect, change leader, in major aerospace companies.

### IEVEX > Experimental Flight Test engineering

TAUGHT IN FRENCH

##### ■ OBJECTIVES

Prepare experienced pilots and engineers selected by EPNER to design, execute and analyze flight tests on aircraft, equipment and airborne systems.

##### ■ CONTENTS

Aerospace techniques performance tests, propulsion test, handling tests, embedded systems tests... 110 flight hours on fixed wing or rotary wing aircraft.

##### ■ CAREER OPPORTUNITIES

Experimental flight test pilot or engineer performing flight tests.

**Partner:** EPNER



## SPACE



### TAS ASTRO >

#### Space Systems Engineering Space exploration optional pathway

##### ■ OBJECTIVES

- ◆ Provide high level inter-disciplinary training in space science, space systems engineering and space project management.
- ◆ Acquire and develop technical skills specific to space systems design.
- ◆ Understand the international, economic and legal aspects of space programs

##### ■ CONTENTS

Missions & systems.  
Space programs- sub-systems: satellites & launchers.  
SEEDS optional pathway (space exploration).

##### ■ CAREER OPPORTUNITIES

Research and design engineers in space industry, agencies or laboratories, leading to system or management position of various space applications programs (Earth Observation, Telecommunications, Navigation, Science, Human Spaceflight...)

### SPAPS > SSpace APplications and Services

##### ■ OBJECTIVES

- ◆ To provide students with the technical knowledge required for telecommunications, Earth observation or positioning services.
- ◆ To enable students to identify the specific constraints of satellite deployment and the key elements of the value chain and business model.
- ◆ To provide students with a broad understanding of space systems to enable them to analyze client needs and design new services.

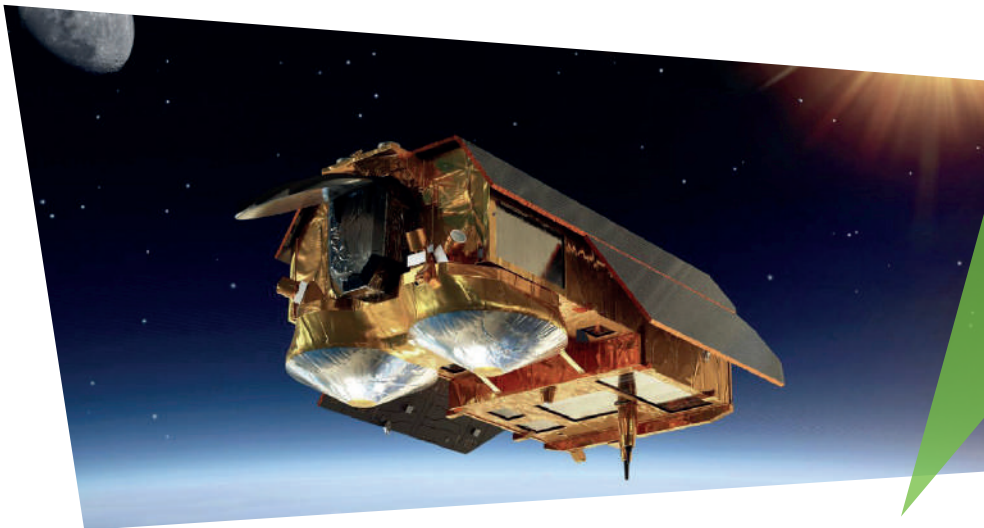
##### ■ CONTENTS

Space systems.  
Satellite-based Earth observation applications and services.  
Space telecommunications and related services.  
Space legal, regulatory and economic/business issues.

##### ■ CAREER OPPORTUNITIES

Jobs related to cross disciplinary use of space data in complex information systems.  
Consulting jobs to identify and define requirements, and implement application solutions using satellites.  
Jobs related to new space challenges.

Partner: **AIRBUS Defence and Space**



**AIRBUS**



## MANUFACTURING



### AMPAS > Advanced Manufacturing Processes for Aeronautical and Space Structures

##### ■ OBJECTIVES

- ◆ Prepare participants to take on high level responsibilities in airframe structure manufacturing plants.
- ◆ Develop technical knowledge of materials science and processes related to supply chain structure and organization.

##### ■ CONTENTS

Aircraft, material and process basic scientific knowledge  
Composite structure forming and machining processes  
Metallic structure forming and machining processes  
Industrial. Organization and management.

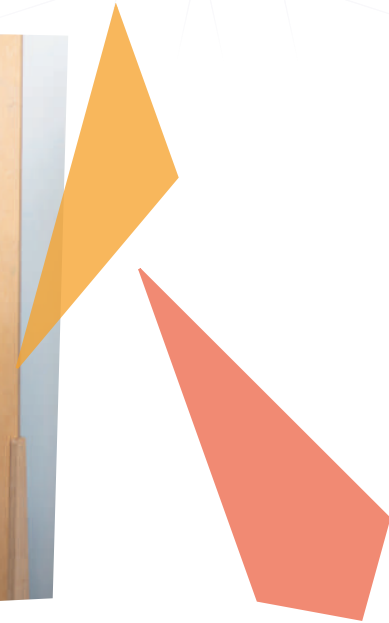
##### ■ CAREER OPPORTUNITIES

Positions in subcontracting companies (aircraft manufacturers, aeronautical maintenance companies) as process, industrialization, production, quality, research and innovation engineering, product, project and production manager.

Partner: **IMT Mines Albi**







## MGPIE > ManaGement de Projets Innovants & Entrepreneuriat

### ■ OBJECTIVES

The aim of the "Management de projets Innovants et Entrepreneuriat" Advanced Master is to simultaneously develop an innovation and entrepreneurial spirit. This program also trains for technological project management (from the origin of the project to its commercialization), with new methods of management on innovative projects with an "Intrapreneurial" spirit.

### ■ CONTENTS

Large range of new technologies (such aircraft disciplines as propulsion or structure, additive manufacturing, machine learning & artificial Intelligence, Big data,...), project management tools & methods, economics & finance, entrepreneurship, innovative projects...

### ■ CAREER OPPORTUNITIES

Startuper, head of innovative project, head of innovative and technologic development (CTO in charge of technical innovation and technologies deployment), etc.

MGPIE will be offered entirely in English for the start of the 2024 academic year. MGPIE has become the Advanced Master IEM - "Innovation, Entrepreneurship & Management", and is getting its accreditation renewed by the CGE.

## APM > Aerospace Project Management

### ■ OBJECTIVES

- ◆ Prepare participants for an international project management career in the global aerospace and defense industry.
- ◆ Develop the latest management skills, knowledge and skills to lead international project teams.

### ■ CONTENTS

Overall overview of aerospace industry - Methodology - Economic and financial aspects - Knowledge management in multicultural team project.

### ■ CAREER OPPORTUNITIES

Head of Aerospace program team, in charge of designing and managing complex projects overseeing costs and risks with Aerospace companies or in defense institutions.

Partners: *École de l'Air et de l'Espace - ENAC*



# ADMISSION REQUIREMENTS AND APPLICATION

## ACADEMIC REQUIREMENTS

A master's degree,  
or an equivalent degree in science or engineering,  
or a bachelor degree supplemented by 3 years of professional experience

Diplomas are also accessible via the validation of prior learning and experience (VAE).



Apply






## LANGUAGE REQUIREMENTS for the masters in french only

Language qualification requested

Score B2-Common - European Framework of Reference for Languages

## for all masters

English qualification requested

<b>TOEFL (IBT)</b>	or	<b>TOEIC</b>	or	<b>IELTS</b>	or	<b>CAE/FCE</b>	or	<b>Linguaskill</b>
								
<b>88 points</b>		<b>785 points</b>		<b>6.5 points</b>		<b>170 points</b>		<b>170 points</b>

Only tests taken after January 1<sup>st</sup>, 2021 are accepted.

## SELECTION AND ADMISSION

**Open in October 2023**

**Deadlines for application:**

From January to July 2024,  
see schedule on our website



Admission requirements



Tuition Fees

People with disabilities, assistance is available at:  
+33 (5) 61 33 89 88  
laurence.ballarin@isae-supaero.fr

## YOUR CONTACTS

Young graduates: Caroline ARMANGE  
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Experienced professionals: Jessica ALIX  
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Graphic design production: ISAE-SUPAERO  
Non-contractual document: July 2023