MASTER OF SCIENCE
IN AEROSPACE ENGINEERING

2025

isae
Institut Supérieur de l'Aéronautique et de l'Espace
SUPAERO

Excellence with Passion

ISAE-SUPAERO

A world leader in aerospace engineering higher education

A SPIRIT OF CONQUEST FROM THE VERY BEGINNING

Created by ambitious, passionate scientists, ISAE-SUPAERO was the very first aeronautical engineering school in the world, founded more than 100 years ago. Today, our passion and vision remain intact. They drive us and take us forward in our quest for academic and scientific excellence. Over time, our graduates have contributed greatly to the development of the aerospace sector and ISAE-SUPAERO has earned a solid international reputation thanks to its engineers and the quality of its academic programs and researchers. The wide range of programs and the many partnerships forged with the academic and industrial worlds have made ISAE- SUPAERO a point of reference and a model to follow.

A wide range of degree programmes in aerospace engineering:

37 programmes

40% international students

1,900 students

65 nationalities present on campus

Access to an extensive active international alumni network:

- Inventors from the designer of the first jet aircraft to the inventor of the black box
- CEOs and high level executives such as: Guillaume Faury, CEO at AIRBUS; Nicolas Maubert, Space Counsellor to the French Embassy and CNES Representative in the United States and Aude Vignelle, CTO at the Australian Space Agency.
- Directors of major programmes such as Caravelle, Concorde, Airbus A320, Airbus A380 and Airbus 350
- Astronauts: Thomas Pesquet, Luca Parmitano and Sophie Adenot
- Many alumni working on space missions
- Founders of Start-ups

An exceptional environment in the heart of Toulouse

Europe's leading hub of aerospace industries, laboratories and universities

A public higher education and research institution

CONTENTS

ISAE-SUPAERO, COMMITTED TO THE ENERGY TRANSITION FOR AVIATION

We have a key role to play for the world of tomorrow.

Everyone needs to do their part to tackle the environmental and social challenges of the 21st century. Convinced that higher education and research are major levers in the transition to a sustainable society, ISAE-SUPAERO has placed sustainable development and the ecological transition of aviation at the core of its commitment. The ambition of the Institute is formalized in the Horizons roadmap, which encompasses all areas of the Institute's operations, including campus life, innovation, research, and education. These actions were highlighted in 2022 by the Institute's 2nd place in the Les Echos Start/Change Now ranking of engineering schools most committed to the ecological transition.

The Institute trains its students to meet the challenge of the energy transition. By supporting them in their systemic approach, their ability to master complex systems and their involvement in public debate, we give them the keys to invent the world of tomorrow. For Master's students, this includes:

- Courses dedicated to environmental and social issues,
- Conferences by experts and awareness sessions throughout the year.

FOCUS ON THE MERMOZ PROJECT

Faced with the climate emergency, aeronautics must be reinvented. This will involve technological breakthroughs, of which hydrogen is one. This is why we are working on the design of the MERMOZ drone, a liquid hydrogen drone, capable of long-distance flight with no CO^2 emissions.

In 2023, the first Mermoz Drone demonstrator powered by gaseous hydrogen successfully carried out its first radio-controlled flight on the runway of the Muret model flying club in the Toulouse region.

"For this pioneering Mermoz Drone project, we are carrying out important academic work on the hydrogen chain. We aim to validate the models developed during this phase so that they can be used for larger-scale aircraft. This work also enables us to enrich the teaching provided by our students and prepare them for the disruptive technologies that will underpin decarbonised aviation," explained Jean-Marc Moschetta, professor at ISAE-SUPAERO.

More about the Mermoz Project

THE MASTER OF SCIENCE IN AEROSPACE ENGINEERING (MAE)

The MAE is a two-year programme. It is composed of 3 semesters of courses which include a Research project and 1 semester of Internship with a Master thesis.
Undertaken after undergraduate studies, including Bachelor's degrees or an equivalent, the Master provides higher qualification for employment or further doctoral studies.

The MAE programme is accredited by the French Ministry of Higher Education and Research in line with the European higher education system. It is internationally renowned and highly regarded as an innovative programme in science and technologies.

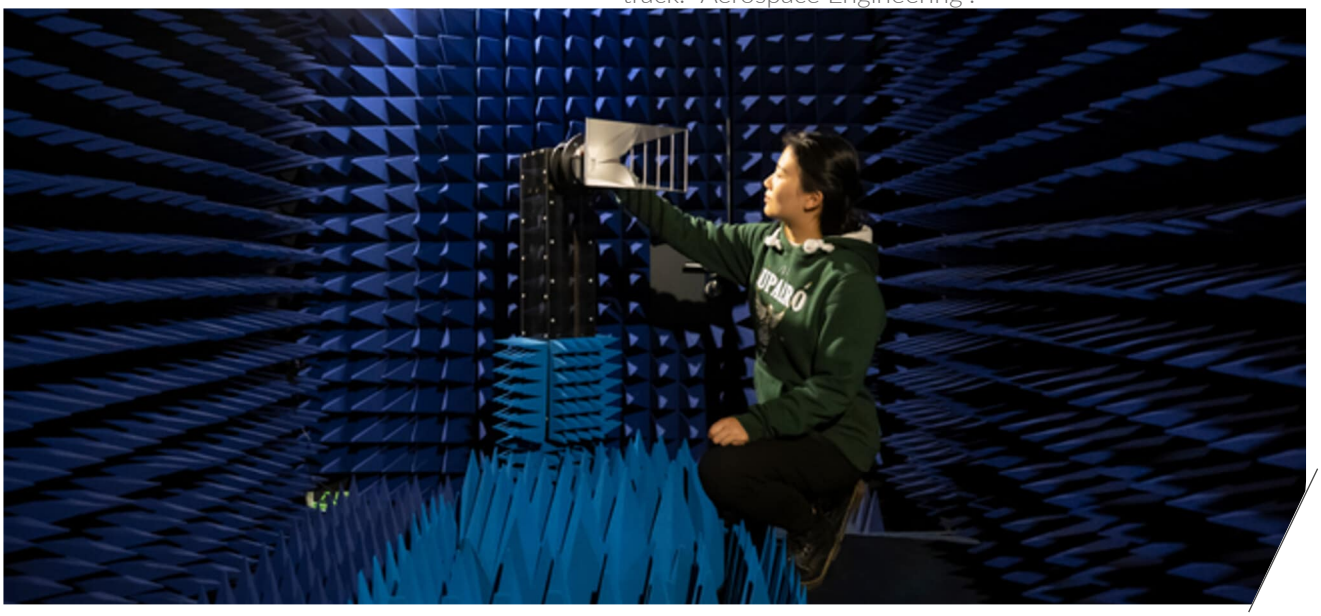
Fully taught in English, this programme is designed to prepare engineering students to find and develop solutions to today's and tomorrow's challenges facing the aerospace industry and the world.

OBJECTIVES

The MAE programme is intended to educate graduate students in subjects relevant to the demanding challenges and needs of the industry.
Endowing students with skills in engineering science, technology and design as they relate to aeronautics and space, the MAE programme is designed to be multi-disciplinary preparing future engineers to easily and efficiently work on aeronautical systems, space systems and their applications, with a focus on the complete life cycle of the system. The MAE programme encompasses a wide spectrum of topics, enabling students to tackle various aspects from design to operating products and systems either in a research organization or in an aerospace company in a multinational environment.

LEARNING APPROACH

The MAE programme is designed around a combination of lectures, tutorials, case studies and projects performed in an industrial environment or in ISAE-SUPAERO's laboratories and research facilities. It is taught in English.
The MAE programme includes a three-semester academic session on ISAE-SUPAERO's premises, taught by permanent professors and visiting experts from the aerospace industry to bring current knowledge and experience.
The last semester consists of a Master thesis undertaken in a company or laboratory in the aerospace sector. After the thesis, students who obtain 120 credits in the examinations will be awarded the "Master en Aéronautique et Espace", track: "Aerospace Engineering".

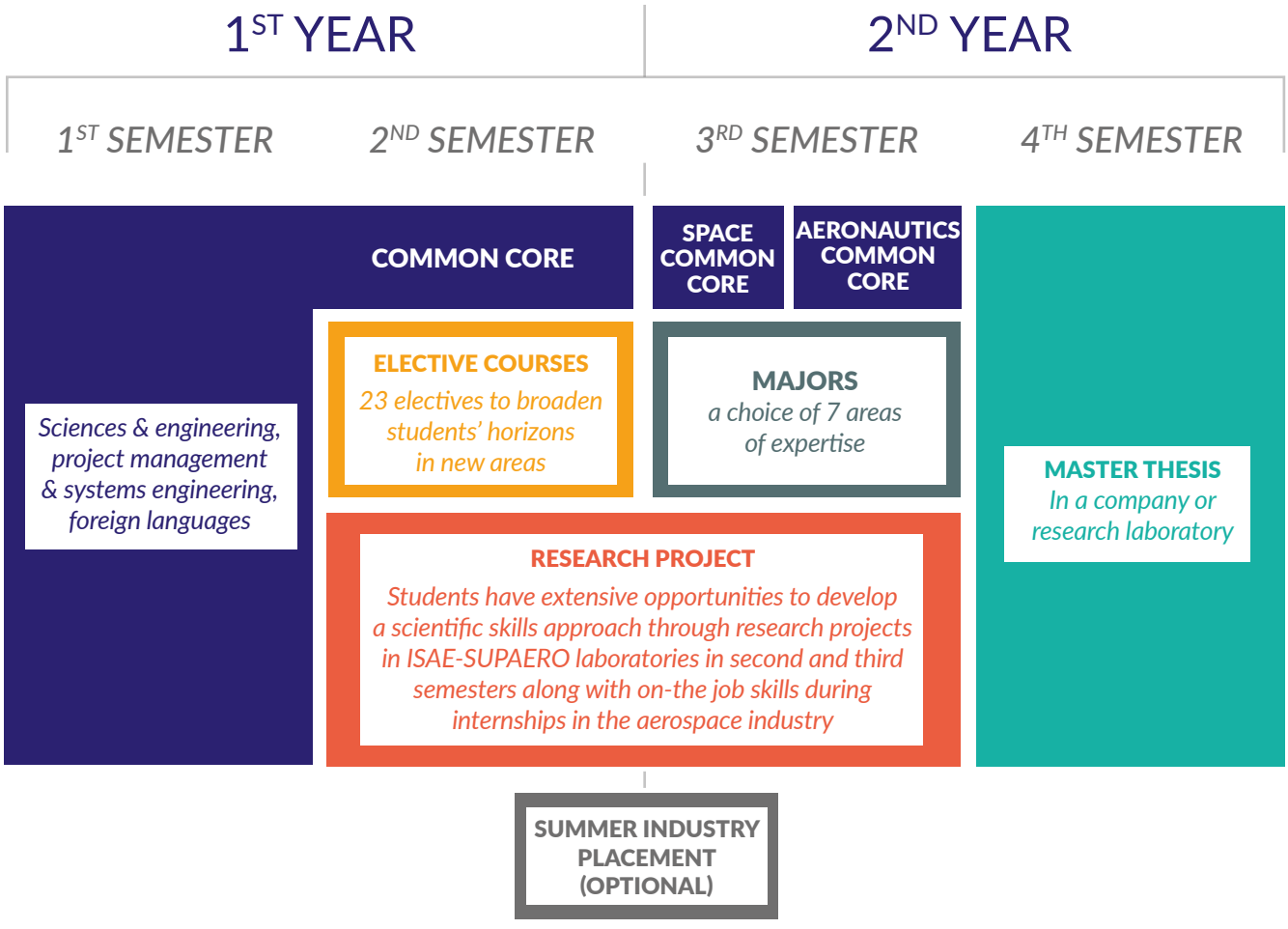


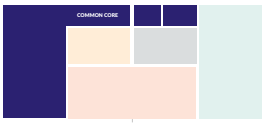
A MULTIDISCIPLINARY CURRICULUM

Fully taught in English

FULLY TAUGHT IN ENGLISH
4 SEMESTERS WITH 30 ECTS EACH

The first semester of the MAE programme focuses on the common core curriculum. At the end of this semester, students make their choices among 7 majors, 23 electives and the Research project. The second semester is dedicated to the Research project and 4 electives linked with the major. The third semester focuses on the student's major and allows the student to explore one of the 7 areas of expertise of the Aerospace Engineering sector in greater depth.





COMMON CORE

The core curriculum is multidisciplinary with a strong grounding in science and engineering, along with courses in project management and foreign languages. During the third semester, students are invited to chose between two common core topics: space environment and missions or sustainable aviation.

Sciences & Engineering

Objective 1: to master solid technical and scientific skills in the major disciplines related to aerospace engineering

- *Aircraft Systems*
- *Space Systems*
- *Human Factors*
- *Aviation Safety Airworthiness*
- *Control*
- *Aerodynamics & Propulsion*
- *Flight Dynamics*
- *Aeronautical Structures*
- *Applied Mathematics*
- *Algorithm and Computing*
- *Signal Processing*
- *Embedded Systems*

Objective 2: to be aware of disciplines playing a major role in new aerospace projects

- *Air and Space Law*
- *Sustainable Aviation*
- *Climate Sciences*
- *Space Medicine*

Project Management & Systems Engineering

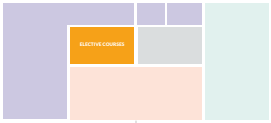
Objective: to develop a comprehensive, interdisciplinary approach to the design and development of a product or system

- *Project Management*
- *Systems Engineering*

Foreign Languages and Soft Skills

Objective: to prepare students to work and communicate in evolving multicultural, team-oriented, and innovative environments. French classes are mandatory for beginners during the two-year programme.

- *Soft skills for innovation (innovation management & projects, creativity development, pitch conception, collective decision-making in situations of uncertainty, conferences with industrial actors in innovation)*
- *Languages: French as a Foreign Language, German, Arabic, Chinese, Spanish, Italian, Japanese, Portuguese and Russian*



ELECTIVE COURSES

Students select four electives out of twenty-three

- *Soft skills for Innovation, Computational Approach to Fluid Dynamics, Structures Design Project, Real Time Control of an Aerospace System, MDO (Multidisciplinary Design Optimization), Computer Networking & Security.*
- *Experimental Approach in Fluid Mechanics, Computational Solid Mechanics, Signal Processing and Digital Electronics Basics, Adaptive Control, Systems Architecture and Programming, Model Engineering and Language Engineering.*
- *Aircraft Structures, Control and Implementations of Dynamics Systems, Simulation for Systems Engineering, Instrumentation and Flight Data Analysis, Aeroengine Architectures and Performance, Orbital Mechanics.*
- *Mechanics of Materials and Structures, Object-oriented Software Development, Acoustics, Aircraft Design Methods, Space Instrumentation.*

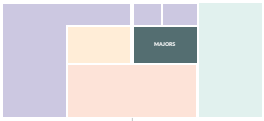
RESEARCH PROJECT

Projects are a key component of the programme and are designed to broaden students' scientific, intellectual and social horizons.

- *This Research project features a graduate-level Research experience over 2 semesters with a focus on acquiring in-depth knowledge, expanding autonomy, and fostering innovation and critical thinking.*

Beyond scientific excellence, ISAE-SUPAERO seeks to ensure quality teaching in French as Foreign Language for its international students. The French as Foreign Language (FLE) Quality Label was obtained in December 2020, with the maximum score of 3 stars.

MAJORS



Students focus on one of seven areas of expertise including:

Advanced Aerodynamics & Propulsion

- *Advanced Aerodynamics*
- *Aeroelasticity & Flexible Aircraft - Aeroelasticity part*
- *Aeroelasticity & Flexible Aircraft - Flexible Aircraft part*
- *Advanced Aerodynamics of Turbomachinery*
- *Numerical Fluid Mechanics*
- *Aeroacoustics*
- *Physics and Modelling Turbulence*
- *Multiphase Flow and Combustion*

Aerospace Systems and Control

- *Multiple-Input, Multiple-Output Systems*
- *Control of Flexible Structures*
- *Robust and Optimal Control*
- *Systems Identification and Estimation*
- *Non-linear Control*
- *Hybrid Control*
- *AI Methods and Tools for Automatic Control*
- *Aerospace Power Systems & Architecture*
- *Aircraft & Space Actuation Systems - Preliminary Design*
- *Model & Sizing of Aircraft Air-conditioning Systems*

Aerospace Structures

- *Aeroelasticity & Flexible Aircraft - Aeroelasticity part*
- *Aeroelasticity & Flexible Aircraft - Flexible Aircraft part*
- *Aerospace Structures - Advanced Structural Dynamics Part*
- *Aerospace Structures - Composite Structures in Services Part*
- *Computational Solid Mechanics*
- *Manufacturing*
- *Mechanics of Materials*
- *Space Structures: Spacecrafts & Launchers*

Embedded Systems

- *Architecture and Programming of Software Systems*
- *Real-Time Systems*
- *Model-Based System Engineering*
- *Real-Time Networks*
- *AI and Autonomous Systems*
- *Architecture, Design and Synthesis of Hardware Systems*
- *System Dependability*
- *Certification*

Space Systems

- *Space Environment and Effects*
- *Mission Analysis and Orbital Mechanics*
- *Space Communications Systems*
- *Space Project: Tools for Simulation*
- *Space Systems Architecture: Ground Segments, Satellites & Sub-orbital Planes*
- *Launchers Architecture*
- *Satellite Propulsion: Chemical & Electrical*
- *Satellite AOCS*
- *Launchers Guidance and Control*
- *Satellite Electrical Systems*
- *On-board Data Handling sub-systems: Functions and Architectures*
- *Satellite Thermal Control Systems*
- *Estimation and Filtering*

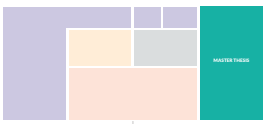
Satellite Applications and NewSpace

- *Space Environment and Effects*
- *Mission Analysis and Orbital Mechanics*
- *Space Systems*
- *Random Signal Processing and Estimation*
- *Wireless Transmission Techniques*
- *Software Defined Radio*
- *Machine Learning for Communications*
- *Constellations and Mobile Services*
- *Satellite Based Navigation*

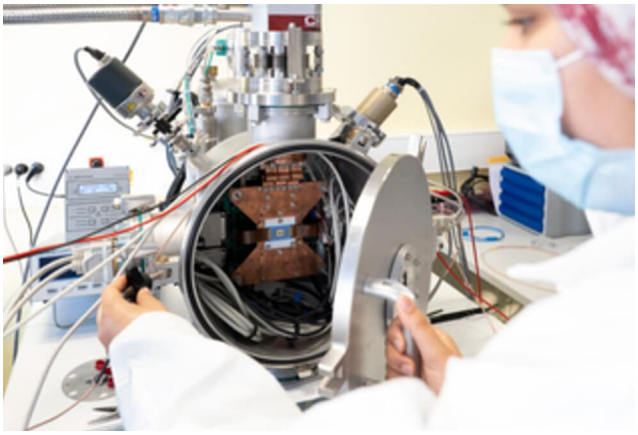
Systems Engineering

- *Requirements Engineering*
- *Systems Engineering Data Technical Management*
- *Systems Modelling and Analysis*
- *Systems Dependability*
- *Systems Design and Architecture*
- *Introduction to Verification & Validation*
- *AIRBUS Case Study: Systems Engineering & Certification of the A350*

MASTER THESIS



The Master thesis is undertaken either in industry or in a laboratory. It enables the student to develop deeper knowledge, understanding, capabilities and perspectives. The overall goal of the thesis is for students to demonstrate their ability to successfully take up scientific or industrial challenges.



New partnership with the National School of Meteorology

Second year students from the MAE can chose to conduct their third semester's Major in the Semester 9 programme of the Weather & Climate Sciences curriculum at the National School of Meteorology in Toulouse.
Six teaching units compose this programme:

- Gather weather and climate observation data,
- Set up and use simulation tools in NWP – Numerical, Weather Prediction – to forecast weather and climate,
- Climate Change Issues: a formal debate,
- Answering a need from a client at a Weather and Climate Service,
- The Economic Value of Met and Climate Information
- Personal Project.

Aircraft Design and Operation Pathway:

Students in the **Aerospace Structures, Aerospace Systems & Control, and Systems Engineering majors** can follow the Aircraft Design and Operation pathway. In this case they can attend two dedicated modules: Aircraft Design Methods and Multidisciplinary Optimization in Semester 2, and they conduct their Research project in this field.
Examples of multidisciplinary projects undertaken in the pathway are:

- Overall Aircraft Design of Blended Wing Body Architecture,
- Thermal Management of a Fuel-Cell Propulsion Pod Installed Under the Wings,
- Multifidelity Aerodynamic Optimization for Aircraft Design.

ACQUIRING RESEARCH EXPERIENCE

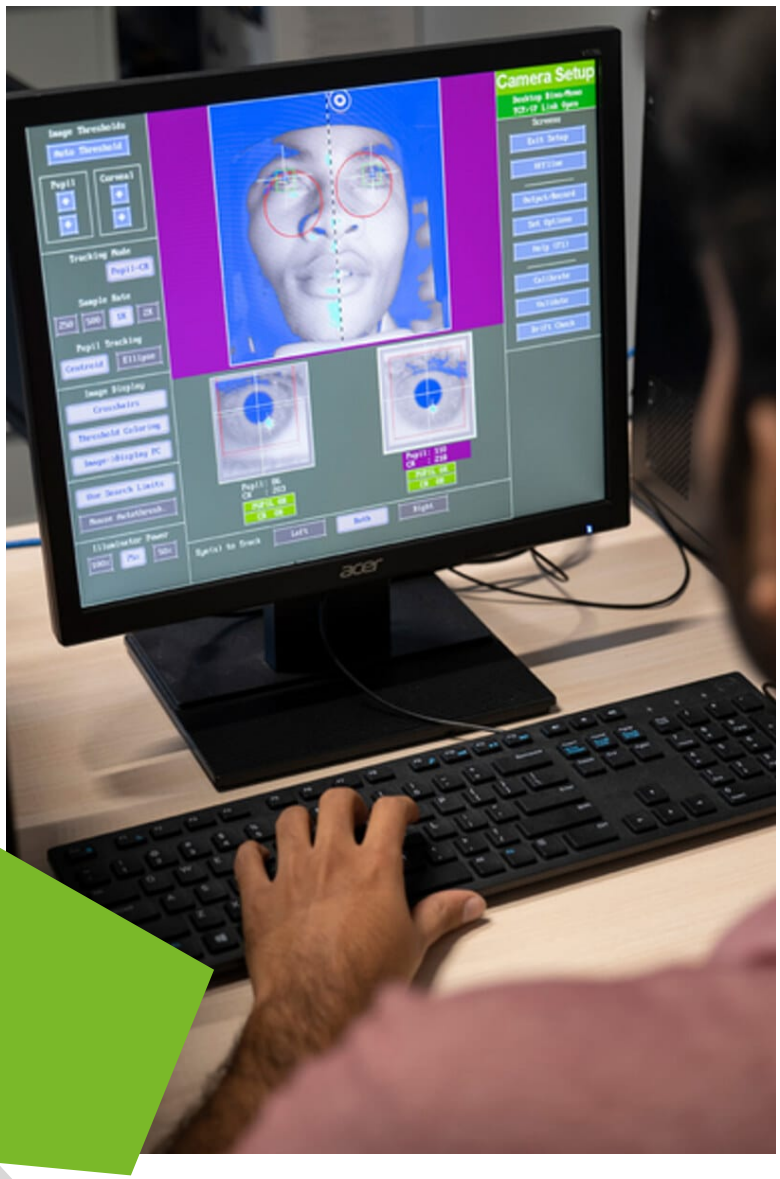
Research laboratories host students to complete their research projects

We are deeply committed to offering our students full access to our research capabilities as well as academic and industrial partnerships, covering the entire field of aerospace engineering. From a research policy point of view, the dual objective is to foster the development of new knowledge as well as to address the needs of the aerospace industry. Our main research partners are ONERA (the French Aerospace Lab.), LAAS-CNRS and OMP (Midi-Pyrénées Astronomical Observatory), the largest French laboratories in the engineering science and space fields. We have numerous long-term research and development agreements with the main European aerospace companies such as: Airbus, Safran, Thales Alenia Space, Rockwell-Collins, MBDA and Liebherr- Aerospace. As well as numerous start-up companies such as Aura Aero, Exotrail, Diodon drone technology. Reflecting our longstanding commitment to higher education and research in the aerospace industry, we are a member of the management board of the Aerospace Valley Cluster of 593 aerospace companies and higher education and research institutions from the Nouvelle-Aquitaine and Occitanie Regions.

More than **400** researchers on campus

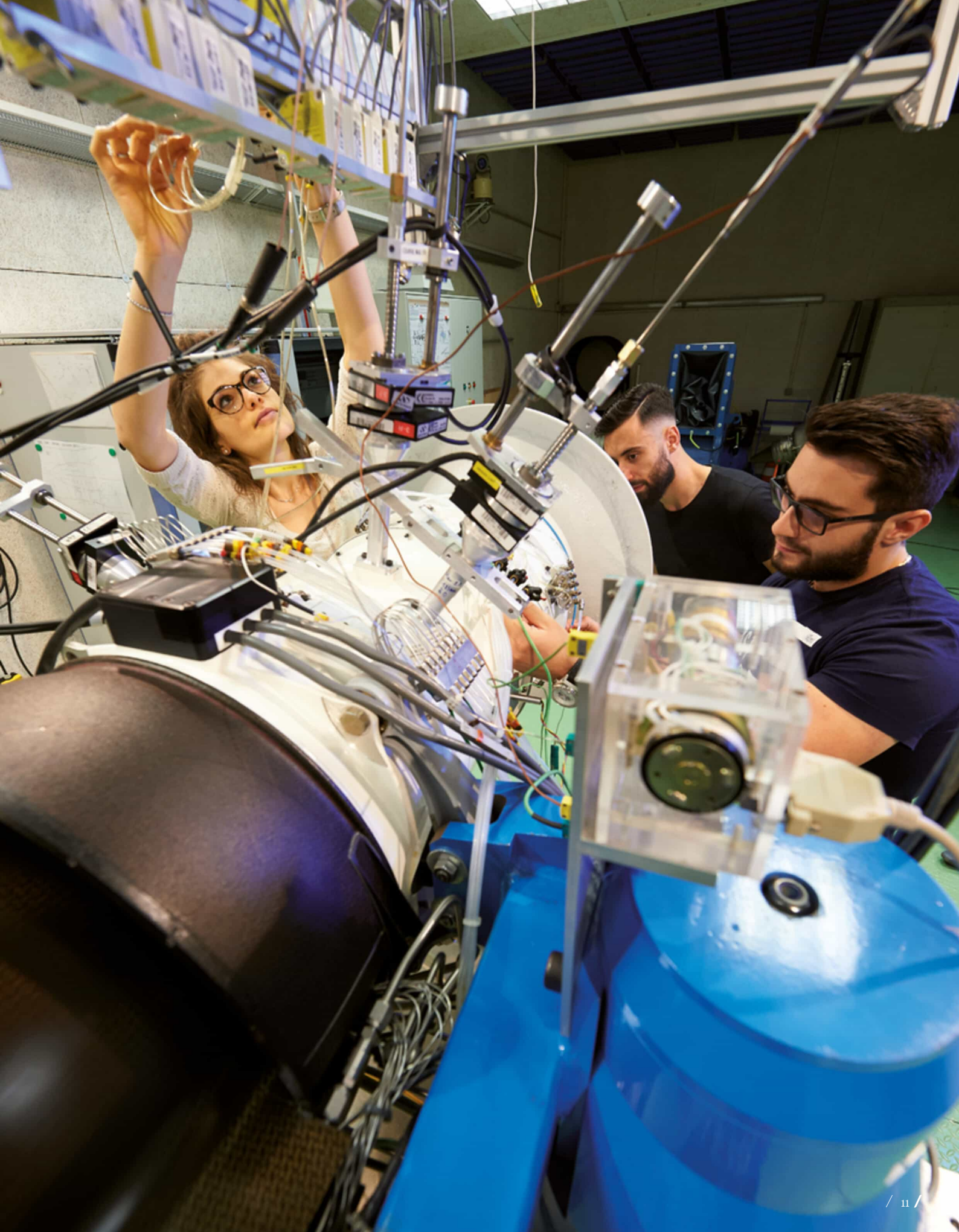
6 doctoral schools

1 international center to host and train doctoral students

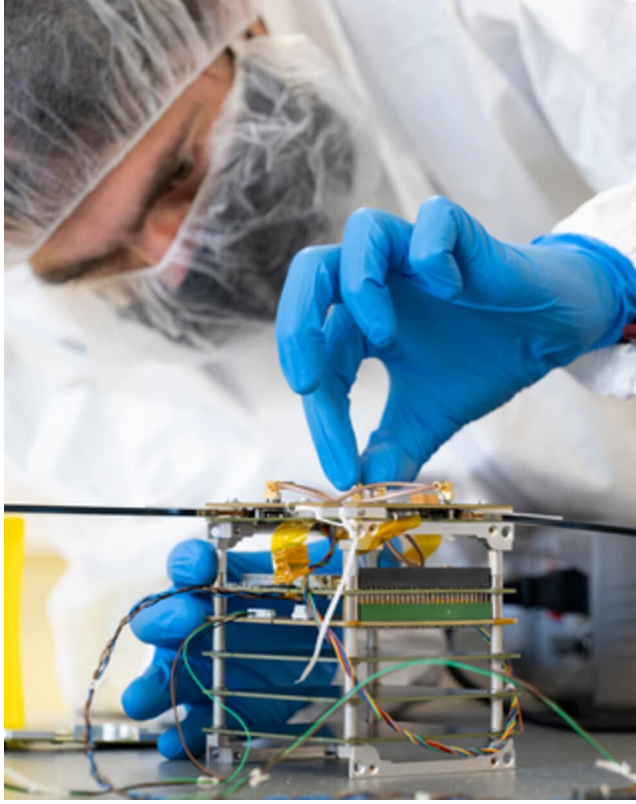


PhD Track:

Every year, several MAE graduates pursue PhD studies in our laboratories. MAE and PhD programmes can be connected in the frame of a PhD Track.



RESEARCH AT ISAE-SUPAERO



World-class research facilities

- Autonomous system platform for micro-drones and robots
- Critical embedded systems platform
- Flight simulators and neuroergonomics platform
- Wind tunnels, aeroacoustics wind tunnel
- Turbofan test bench
- 6m high Drop tower, gas guns
- Fleet of 8 aircraft: Aquila, Robin DR 400, Vulcanair P68 Observer
- Software-defined radio room
- Clean rooms for satellite integration
- Ground station for satellite tracking and operation
- Satellite command and control center
- Additive manufacturing machine
- 320kV X-Ray Irradiator.

A multidisciplinary scientific policy:

5 teaching and research departments

The Department of Aerospace Vehicles Design and Control (DCAS)

The department is a multi-disciplinary team structured in four research groups:

- *Aircraft Design,*
- *Space Systems,*
- *Decision and Control,*
- *Neuroergonomics and Human Factors.*

DCAS covers a wide variety of problems including guidance and navigation, unmanned vehicles collaborative control, design of future aircraft architectures for the decarbonisation of air transport, space propulsion systems, spacecraft trajectory design and brain-machine interfaces for pilots and astronauts. Its unique resources include motion flight simulators, a drone fly arena, and a fleet of single-engine (DR400) and a twin-engine (P68) aircraft used for flight experiments.

DCAS performs a research activities in strong interaction with major industrial players in the aerospace sector.

The four research groups collaborate in the following areas:

- *Safer navigation and control of aerospace systems,*
- *Integrated multi-disciplinary aircraft design,*
- *Advanced space concepts.*

The Aerodynamics, Energetics and Propulsion Department (DAEP)

The department is organized on the basis of three core research groups:

- *Fundamental Fluid Dynamics,*
- *External Aerodynamics,*
- *Turbomachines and Propulsion.*

The department works closely with the scientific community in Toulouse on joint research projects with French and international academic partners, either on a formal basis or through researcher-to-researcher connections. The department also has research agreements and contracts with major aeronautics firms, equipment suppliers and sub-contractors.

The Department of Electronics, Optronics and Signal Processing (DEOS)

The department develops and produces the payloads for the advanced aeronautics and space applications of tomorrow. Its team's skills cover a wide range of technologies, from silicon sensor design to interplanetary science payloads, and from theoretical signal studies to advanced communication and navigation systems.

The departement is organized into five core research groups:

- *Micro Electronic Image Sensors*
- *Photonics, Antenna, Microwave and Plasma*
- *Navigation, Communication, Radar*
- *Communications and Information Theory*
- *Space Systems for Planetary Applications*

The Complex Systems Engineering Department (DISC)

The department develops knowledge in mathematics and computer science for the aerospace industry. In education as in research, DISC deals with models, methods and tools to master the behaviors and performances of complex systems. This complexity may come from the multiphysics or multiscale nature of the systems, their dynamic behavior or their connected and distributed structure.

The department focuses on research driven in:

- *applied mathematics*
- *connected systems*
- *critical systems analysis and design*
- *learning, decision, and optimization*

The Department of Mechanics of Structures and Materials (DMSM)

The department organizes and supervises all the teaching activities associated with the mechanics of deformable solids and structures for ISAE SUPAERO programs, in synergy with applied research on aerospace materials and structures. Its team is composed of professors, researchers, engineers, technicians and administrative staff. Classes enable students to gain skills that are closely aligned with the needs of the aeronautical and space industry in the material & structures fields but also to address new issues related to multi-disciplinary or environmental considerations. Team projects address practical questions and solutions to be managed in keeping with a research and development methodology, in collaboration with experts in the industry and/or research or test centers that are ISAE-SUPAERO partners, taking advantage of the synergies with the Institut Clément Ader laboratory (ICA CNRS 5312).

Three research topics are at the center of DMSM's activities:

- *Durability & damage tolerance of composite and metallic materials*
- *Modelling & qualification of aerospace structures under static or dynamics loads*
- *Multiphysics Requirements-Driven Simulation Design*

All 5 departments support a micro-aerial vehicle development programme on the international level based on student projects, research and innovation projects, and international competitions.

STUDENT PROJECTS

WHAT IF WE RELINQUISH A LITTLE BIT OF CONTROL TO SAVE ENERGY AND FLY FURTHER?

An Energy-Aware Study of the PX4 Total Energy Control System (TECS) Controller for Long-Range Flight

Deeksha Kota and Rohan Dhansoia, MAE students majoring in Aerospace Systems and Controls, have been working on conserving a drone's energy by loosening its autopilot stabilization setpoint requirements. The Mermoz Project's (see page 4) motivated their undertaking since all Mermoz subsystems are under investigation regarding energy savings due to the mission's challenging distance.

While crossing the ocean, random and chaotic atmospheric disturbances could either increase or decrease the energetic state of the aircraft. Conventional autopilot systems will correct the aircraft's configuration to a predefined nominal flight condition by injecting or rejecting the deficit or surplus of energy. On the other hand, the students propose not to reject excesses of power outright, but instead allow the aircraft to return to its nominal condition more slowly. In turn, subsequent energy-drawing disturbances could have a lower impact on the overall energy balance, thus increasing the aircraft's range in the presence of perturbations.

Deeksha and Rohan worked together during two semesters with clearly defined missions. Rohan focused on control laws and energy aspects through a simulator he designed himself. The resulting software simulated standard drone stabilization control algorithms and the physics of an aircraft. As for Deeksha, she focused on the avionics integration of a flying prototype for flight-testing their findings. She integrated an entire drone at ISAE-SUPAERO's Fablab, the InnovSpace. In addition, she designed flight test protocols and checklists conforming to French airspace regulations and modified the open-source autopilot code to implement their ideas and flight-testing requirements. All code generated during her work can be downloaded online, and drone enthusiasts worldwide can use it for free through her GitHub page.

This project had an outstanding balance between what they learned in theory in class and practical, real-world experiments. It gave them a deeper understanding of flight control systems and the process of conducting flight campaigns. After the project, Deeksha joined as an intern a team responsible for generating optimized test flight points to minimize flight test hours through machine learning techniques. Similarly, Rohan joined a group that designs and validates Airbus auto-flight systems.

The plane was named «AMARELINHO» by the team, which in Portuguese means «the little yellow one!»

This project was conducted at the ION**LAB** @ ISAE-SUPAERO with the support of the DCAS/DISC departments and InnovSpace. For more information on ION**LAB**'s projects, please visit http://www.ionlab.fr.

OPTIMIZATION TOOLBOX FOR RAPID COMET-I TRAJECTORY ANALYSIS

Did you know that a comet can only be discovered 5 years before it passes through the Solar system? How Science finds efficient solutions to study comets and understand their past and evolution.

Miguel Rebelo, an MAE student, is passionate about space exploration, astrodynamics, and scientific software development. As a Space Systems major student, he had the opportunity to conduct a research project on the possibility of observing and studying a comet as soon as it enters in the Solar System by deploying a space probe at the right place.

Supervised by the DCAS* department and members of Comet Interceptor Mission of the European Space agency (ESA), this research project is directly linked to one of the ESA's missions which consists in performing a fly-by around a yet-to-be-discovered comet that is due to be launched in 2029.

Let's explain the context: Comets have amazing scientific potential since they preserve traces of the first moments of the formation of the solar system. Comets such as Halley have already performed multiple visits and, because of their interaction with the Sun, their morphology and chemical composition have been modified significantly. It is thus of great interest to observe a comet which has never passed through the solar system since its formation. By definition, we don't know a priori where these comets are right now. Moreover, they are currently only discovered approximately 5 years before they pass through the solar system, which is an unfeasible amount of time to design and launch a mission. Because of this, Comet Interceptor will be placed at the Sun-Earth Lagrange L2 point (like the James Webb Space Telescope). It will wait there until a new comet is discovered and will then depart and meet it as it is passing by the solar system, providing some undoubtedly groundbreaking science.

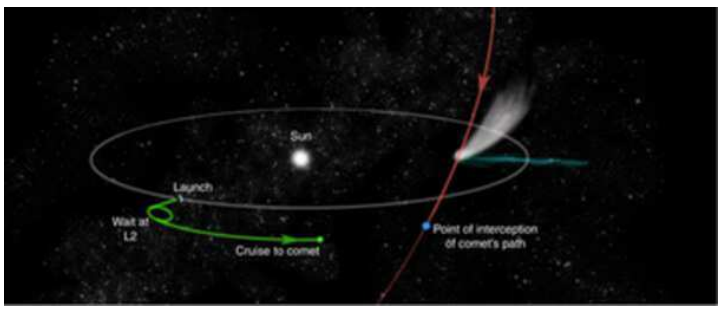
Based on this project, Miguel's mission was to streamline and expand the tools provided by his Professor, which are used to conduct mission analysis. More specifically, he worked on the trajectory optimization between the Lagrange L2 point and the intercept point, with the aim of obtaining a trajectory which suits the fuel budget and the scientific constraints of the mission. The project involved some theory in astrodynamics which he then implemented in MatLab.

According to Miguel, the best part of this project is the opportunity it provides to personally contribute to the analysis and the planning of a future ESA mission: "It felt (and feels) absolutely surreal!"

His work has been integrated into the activities of the mission's Science Working Team and it expanded the capabilities for trajectory design and mission analysis. A valuable tool for the researchers working on this amazing mission!

For his 4th semester Internship, Miguel is working at CNES* on mission analysis for the CubeSats of ESA's Hera mission. Indeed, his research project reinforced his desire to pursue a career in Space and its related fields and has taught him a lot of key knowledge for his future career.

*DCAS : Department of Aerospace Vehicles Design and Control
*CNES : National Centre for Space Studies



Credits: Snodgrass, C., Jones, G.H. The European Space Agency's Comet Interceptor lies in wait. Nat Commun 10, 5418 (2019).

ISAE-SUPAERO MASTER GRADUATES

We have already taught more than 28,000 engineers who are contributing to the development of the aeronautics and space sector in France and around the world. Our engineers' vocation is to become future leaders in the aerospace industry and the world of tomorrow. This is why we have developed an integrated approach with education, research and innovation through partnerships with academic players, many industrial stakeholders and a network of the best international universities.

KUNAL GUPTA
INDIA
Advanced Aerodynamics and Propulsion

At the end of my Bachelor's, I was looking for a school that would allow me to pursue my passion for Aviation. I was looking for a school that would impart clear and in-depth concepts of Aerospace Engineering and teach me how they are applied in the industry. ISAE-SUPAERO is a culmination of all these. I could learn from its industry-leading partners and understand how classroom subjects become a reality.

I chose Advanced Aerodynamics and Propulsion as my major because I have been passionate about what powers flight and what its future is.

The strong asset of the program is its diversity – bringing together the best minds from all over the world. During my time at ISAE-SUPAERO, I got to learn a lot from my classmates.

I did my last semester internship at ISAE-SUPAERO, on a collaborative project with Airbus, on the Aeroacoustic interactions in a Turbofan thanks to the Head of my major.

I believe the internship and my research project played a vital role in finding the right job for me. Currently, I work as an **Engine Performance and Preliminary Design Engineer at Capgemini Engineering**, helping design the future propulsion system. In the end, I earned much more than a Master's degree!

ANDRÉ ROQUE
PORTUGAL
Space Systems

Being a very industry-oriented student, ISAE-SUPAERO was the obvious choice for my Master in Aerospace Engineering. Located in Toulouse, the heart of European aerospace, ISAE-SUPAERO provided me with unmatched networking opportunities and support in securing internships and jobs. Opting for the Space Systems major fueled my passion for space exploration, exposing me to diverse aspects of space missions through learning from industry experts and interacting with real-life projects.

Another great strength of the program is its exceptional work-life balance: with a great distribution of subjects, projects and exams throughout the year, students never feel overwhelmed, and are actively encouraged to participate in extracurricular activities, projects and sports. During my final semester, I chose to do my internship at Thales Alenia Space in Cannes, where I developed orbital control systems, to manage satellite end-of-life scenarios and minimize human risk during spacecraft reentry.

Now, as a **GNC Engineer at Airbus** in Marignane, France, I focus on developing and testing control laws for upcoming vehicles. My immediate career goal is to get a few good years of technical engineering experience, before transitioning into a systems engineering or project management role.

MIRIAM SCARANO
ITALY
Aerospace Structures

ISAE-SUPAERO, with its reputation as a pioneering institution in aerospace engineering and its location in the main European aerospace hub, represented for me the chance to immerse myself in a multicultural environment while shaping my academic path surrounded by excellence.

I specialized in Aerospace Structures, and I did my Research Project on the automatic sizing of a Vertical Tail Plane for an A320 aircraft. It was my first approach to research and a posteriori, I can say it was a great learning experience. My Research Project was presented at an international conference and provided me with the opportunity to publish my first scientific paper.

What I got from this Master's program is above all my initial expectations. Not only did I refine my knowledge, but I was also supported to conduct my internship abroad in Canada and to launch my career through forums, mock interviews, CV review sessions as well as interaction with industry-leading experts. Not to mention the social network it allowed me to build around me, which enriches my life every day.

Currently, I work as an **Aerospace Engineer for ALTEN**, a sub-contractor for Airbus. My ambition is to become a manager overseeing a meaningful project in aviation.

ALEX AQUIETA NUÑEZ
ECUADOR
Systems Engineering

I chose ISAE-SUPAERO since it appears to me as the most prestigious and well-known university in Europe for aerospace academic and research programs. Personally, I had the dream to come to France a long time ago and I applied for the MAE, attracted by the opportunity to obtain a scholarship to cover my studies (which I succeeded!)

In my opinion, the most valuable strength of the program is firstly the provided link between the institute and industry. Having the chance to be trained by experienced professionals from the aerospace industry gives an incredible advantage at the time of looking for some practical solutions instead of only theoretical analysis, plus this link eases your job search upon completion of your studies. The multicultural environment within this program is another very enriching asset and finally, the well-equipped facilities when it comes to putting knowledge into practice (laboratories, wind tunnels, etc.).

Willing to complement the technical knowledge acquired during my academic training with a managerial perspective and to acquire a global vision of business within the aerospace industry, I carried out my internship at Expleo, an engineering consulting company. I worked in the field of project management support. In 2023 I am working as a **Project Manager at Expleo group**, subcontracted by Airbus Defence & Space, in charge of managing and delivering activities within the scope of Space and Connected Intelligence. Thanks to my academic training and experience, I perform a key role, liaising between the technical team and the business direction. In the future, I plan to continue to focus on the management side of the industry.

CLOSE COLLABORATION

WITH COMPANIES & INDUSTRY

1,365
Engineers, and/or researchers from leading companies are visiting lecturers

250
Companies support our development

An alumni network of over
28,000
graduates

Every year companies receive more than
800
ISAE-SUPAERO students for internships and Master theses. Conferences, industrial visits, internships in companies, forums, recruitment workshops

35
partnerships signed with small and medium-sized companies and major industrial players

8
Company chairs for teaching and research in innovative programs

INDUSTRY PARTNERS

DASSAULT AVIATION
ATR
PWC
CAPGEMINI
AIRBUS
DGSE
THALES
MBDA
PARROT
SAFRAN
ACCENTURE
AURA AERO
LIEBHERR
Naval Group
DAHER
ARIANE GROUP
SOPRA STERIA
ALTEN
KXIOP
DASSAULT SYSTEMES
SII
COLLINS AEROSPACE
CEA/DAM
DGA
EUTELSAT
HEADMIND PARTNERS

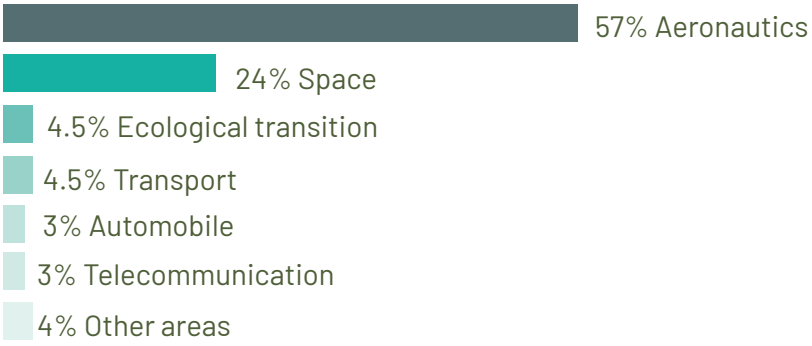
A WIDE RANGE OF EXCITING FUTURE CAREER PROSPECTS AWAIT YOU

WIDE-RANGING JOB OPPORTUNITIES

Our graduates will work as technical experts, researchers and managers in the fast-expanding aerospace sector and key sectors of the economy, in Europe and all around the world.

CLOSE-UP ON THE CLASS OF 2023*

Business areas

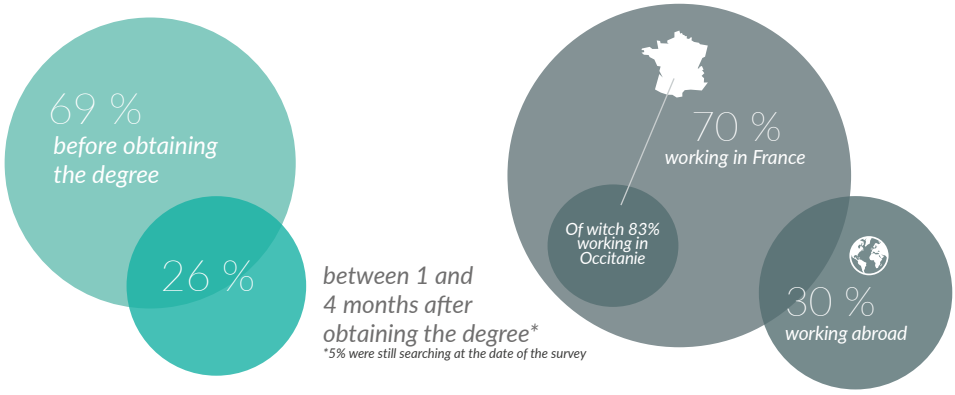


The Career Center at ISAE-SUPAERO

The Career Center provides support for students entering the workforce. Every year companies receive more than 800 ISAE-SUPAERO students for internships and master thesis.

Conferences, industrial visits, forums, recruitment workshops are organized by our Career Center.

Jobs after Graduation



Main recruiters

AIRBUS · Capgemini engineering · SAFRAN · AKKODIS · ALTEN · THE ADECCO GROUP · sopra steria

*Survey on 1st jobs, graduating class 2023, 83% of respondents out of 132 young graduates approached

CAMPUS LIFE
IN THE HEART OF TOULOUSE

Located at the heart of the scientific and university complex, our campus covers 22 hectares along the lovely, UNESCO classified Canal du Midi. Teaching, living and sports facilities – we have it all!

A complete range of athletic facilities

You will enjoy the pool, gym, climbing walls, fitness center, football and rugby fields, tennis and squash courts.

More than 100 clubs for a dynamic social life: culture, sports, technical clubs (micro-drones, space club, aeromodelling, robotics, etc.), social and humanitarian actions, event organization, etc.

Aeronautical sports

Ten minutes from campus, we have a fleet of **8 planes** (TB 20, Robin DR 400, P68 Observer, etc.). Students have the opportunity to earn a wide range of flight licenses under very preferential conditions: powered aircraft gliding, parachuting, and paragliding.
Every year 35 students obtain their pilot's license.

Student residences and the Student Center

The **6** entirely new residences offer **1000 housing units**.
Residences include common areas such as study rooms, kitchens, and laundry rooms.
The Student Center includes a large main room with a snack bar area, a living room, TV rooms, and rooms for student clubs and activities.

Toul'Box

The assistance you need to settle down smoothly in Toulouse.
A Welcome Kit to make your life easier from day one:

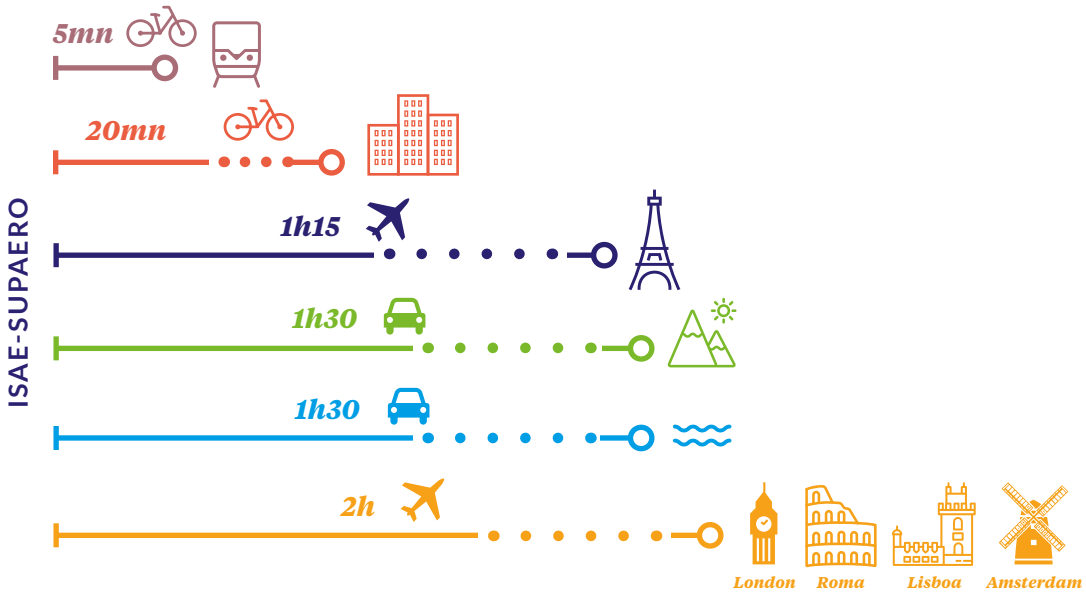
- *Housing on Campus,*
- *Bank account,*
- *Transport card,*
- *Other administrative formalities.*

TOULOUSE,
EUROPEAN CAPITAL OF AERONAUTICS AND SPACE

Nearly **90,000** direct jobs in aeronautics and space.
The leading French region for Research and aerospace Education.

4th largest city in France
Top 3 most attractive cities to study in France

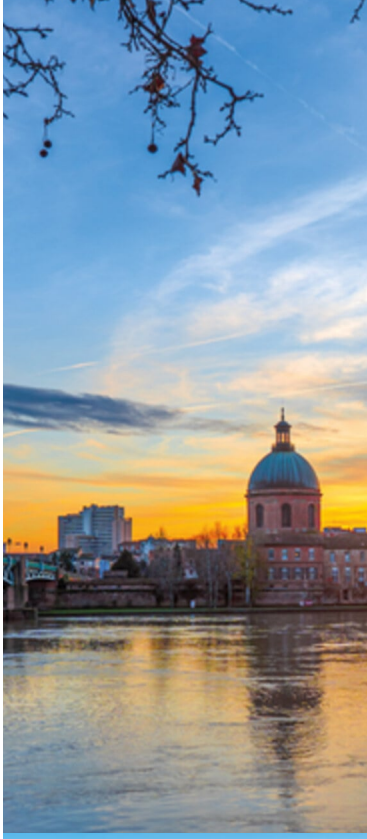
Known as "la Ville Rose", in reference to the color of the city's many historical brick buildings. Repeatedly voted by the French as being the most desirable place to live in France: exceptional quality of life, a great place to live as a student!



Toulouse airport has low-cost flights to the main European cities!

"Bienvenue en France" accreditation

The "Bienvenue en France" label accredited by Campus France, distinguishes French higher education institutions, that have developed facilities to host international students at French higher education institutions, and represents a promotional and outreach tool for the institution.
ISAE-SUPAERO is one of the few institutions receiving the '3 stars' certification. The certification demonstrates the quality of the reception from our School.



FUNDING

Students can apply for the Excellence Scholarship programmes provided by ISAE-SUPAERO, the ISAE-SUPAERO Foundation and our industrial partners.

THALES

STAI Excellence Scholarship

The scholarship from Thales' Chair for Integrated Air Transport Systems (STAI) covers tuition fees and part of living expenses. (Aircraft-related majors only.)

Fondation ISAE-SUPAERO
Reconnue d'utilité publique

ISAE-SUPAERO Foundation Scholarship

The Foundation Scholarship covers tuition fees and part of living expenses.

AIRBUS

CEDAR Excellence Scholarship

The scholarship from Airbus's Chair for Eco-Design of Aircraft (CEDAR) covers tuition fees and part of living expenses. (Aircraft-related majors only.)

ISAE SUPAERO
Institut Supérieur de l'Aéronautique et de l'Espace

ISAE-SUPAERO Excellence Scholarship

This scholarship covers tuition fees and part of living expenses.

Follow the QR code for more information about tuition fees and funding

Scholarships applications:
Open from *October* to *December*

GIFAS

GIFAS Excellence Scholarship

The scholarship from GIFAS (the French aerospace industries association) covers a part of the tuition fees

CAMPUS FRANCE

For more information on financial aid for international students in France, visit the Campus France website: http://www.campusfrance.org.

Numerous State scholarships are available as well: CONACYT (Mexico), BECAS CHILE (Chile), COLFUTURO (Colombia), CHARPAK (India), BEC-AR (Argentina), etc.

JOIN THE MASTER IN AEROSPACE ENGINEERING

Fully taught in English

Eligibility

This programme is particularly suitable for students with:

- **A bachelor's degree in aerospace or aeronautical engineering, mechanical engineering or mechatronics**
  All majors are open to these students: Advanced Aerodynamics and Propulsion, Aerospace Structures, Space Systems, Aerospace Systems and Control, Embedded System, Systems Engineering, Satellite Applications & NewSpace.

- **A bachelor's degree in electrical engineering, electronics, telecommunications**
  Five majors are open to these students: Space Systems, Aerospace Systems and Control, Embedded Systems, Systems Engineering, Space Imaging Navigation and Communication.

- **Other profiles in engineering and science**
  We accept application from student with backgrounds in Industrial engineering, Civil Engineering or physics, mathematics, or Computer sciences (ISAE-SUPAERO admissions officers can provide you with information on the majors open to you).

On-line Application

Applications open in October for next year's intake in September:

- *Resume/CV*
- *Cover letter*
- *Copy of highest diploma or certificate of enrollment*
- *Transcripts for the 3 last years*
- *2 letters of recommendation*
- *TOEFL (IBT): 88 points (Inst. code: 9820) or TOEIC: 785 points, or IELTS: 6.5 points or CAE/ FCE: 170 points or Linguaskill: 170 points*
- *GRE test results if available (not mandatory)*

For more information on the admission procedure, please visit:

Justine de PERRY - Admission Advisor

Joel BORDENEUVE-GUIBE - Head of Master programme

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BP 54032
31055 Toulouse CEDEX 4
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