



## Mastère Spécialisé® / Advanced Master

# Helicopter, Aircraft and Drone Architecture

WITH AIRBUS HELICOPTERS



### ■ Objectives

The Advanced Master's course in "Helicopter, Aircraft and Drone Architecture (HADA)" is jointly designed and developed by ISAE-SUPAERO and Airbus Helicopters. This 2-semester program provides a high-level of engineering and technical skills for careers in the aircraft, helicopter and drone industries.

This new program provides the basic skills required for aeronautical engineers (architecture, certification and structures) and specific skills to identify problems, come up with alternatives, choose and implement solutions to aircraft, helicopter and drone projects. Drones and Urban taxis will be developed as they represent a growing part of the activity in the future aerospace sector. Industrial, regulatory and logistical challenges will therefore emerge. As a result, future aerospace engineers interested in being part of these innovative projects will need to call on and develop new skills and expand their current knowledge. This program offers full training from electronic systems to structures and taking in aerodynamics, flight dynamics and certification while encouraging and taking into account the diversity in the profiles of selected applicants.

This ADVANCED MASTER course takes into account cutting edge techniques required for future aircraft and rotorcraft systems including the new challenges associated with urban mobility. The present program is a high level Master course recognized by industry and adapted to current and future aeronautical engineering.

### ■ Learning approach

#### First semester:

Academic session from September to March, provided by the tenured professors at ISAE-SUPAERO and aeronautical industry experts with their updated knowledge and experience (Airbus Helicopters, Airbus Group, Safran/Turbomeca, Thales, etc.). Including: lectures, tutorials, and practical sessions.

#### Second semester:

Students have to conduct a professional thesis or make an 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 is concluded by the preparation of a report and an oral dissertation in front of a thesis committee.

### ■ Organization

#### Head of program

- Prof. Jean-Marc MOSCHETTA  
jean-marc.moschetta@isae-supaero.fr

#### Course duration

One year full time: 6 months of courses and 6 months of professional thesis or internship

#### Course start date

September

#### Location

ISAE-SUPAERO

#### Teaching language

English

### ■ Syllabus

#### Part 1: Aircraft structures, Aircraft architecture and certification – 100 h

Aircraft architecture – Certification – Computer Aided Design  
Aircraft Structures

#### Part 2: Fixed-wing Aircraft – 130 h

Engines and powerplant – Aircraft general -systems – Avionics systems – Flight dynamics

#### Part 3: Helicopters – 150 h

Helicopter: Aerodynamics, performance and flight qualities  
Helicopter dynamics – Helicopter materials and construction technics – Helicopter Systems: prototyping, tests and production quality

#### Part 4: Drones – 120 h

Designing drone systems - Payload and sensors for UAVs - Drone safety and airworthiness - Drone guidance and navigation - Neutral network for control and diagnostics

### ■ Career opportunities

This program prepares participants for a wide range of professional opportunities from design, certification and operation of civil and military aircraft, drones and helicopters in France and overseas.

#### Companies recruiting our students

Altran, Airbus Group, Airbus Helicopters, Safran-Turbomeca, Thales, Dassault Aviation, Gendarmerie Nationale, Helibras (Brazil), AVIC (China) HAL (India), Pawan Hans Helicopters Ltd (India), Airbus Helicopters Mexico, Algerian Air Force, Brazilian Navy, Chile Air Force, Indian Air Force, Pakistan Army, Tunisian Air Force, Sauber f1 team...





## Testimonies

### Why did you choose ISAE-SUPAERO and apply for this MS? What were your objectives?

ESTELLE CADARS

Graduated in 2019

Quality Assurance Manager | Aviaco France

JULIEN VOIRIN

Graduated in 2019

Structural Design Engineer | Dassault Aviation

During my studying in engineering school in apprenticeship, I have worked in Airbus Helicopters. After this experience I was determined to work in a helicopters company as an engineer but I didn't have any technical background. ISAE-SUPAERO is the most famous school to learn about aeronautic, so it was the best solution to fill my wish.

**I have chosen the Master HADA because it's the only one with helicopters lessons and it's a general one without any specialization so it has allowed me to have a good perception of different kind of jobs.**

Coming from a non-specialized engineering school, INSA Rouen Normandie, and being really fascinated by flying systems, for me it was obvious to apply for ISAE-SUPAERO which is one of the best engineering school in the aeronautical field, in France. Therefore, I was sure that this school would open many doors for my future career.

MS HADA perfectly met my expectations since my goal was to discover and learn all about flying systems. My second interest was to have a first contact with an innovative and new system: Drones.

### According to your experience, what are the strong assets of the Master?

The strongest assets of this master are: the quality of the lectures taught by specialist engineers from several companies. They are passionate about their jobs and they don't hesitate to take time to transmit us their experiences. It gathers all fields regarding aircraft, drone and helicopters (regulation, design, dynamics, avionics, systems, performance etc). And then, there are lot of visits planned in several companies in Toulouse and in AH in Marignane.

**The strong assets of MS HADA master are numerous: the proximity with industries (experience at Airbus Helicopters), with teachers/engineers who were really easy to interact and always there to dedicate their time in moments of need.** The fact we obtain an overview of all the systems in three different categories (planes, helicopters, drones), that companies value this program, giving us a chance to find good internships and opening the gates for the best jobs out there. And last, but not least, the fact that this master is entirely taught in english.

### What are your career plans?

I have been lucky to perform my internship in Airbus Toulouse in the Flight Test department. My plans after graduation is to join AHD for two reasons: I always wanted to work as a flight test engineer for helicopters, and thanks to this Master I have discovered the drone area, so I hope I will work as well on the taxi drone project in Donauwörth !

I plan to stay to stay in the aeronautical domain. I want to continue working in the design office with dimensioning of aeronautical structures, as I'm doing during my internship at Dassault Aviation. My initial plan is to gain a strong technical luggage in mechanics and, throughout the years, be able to evolve in my career inside Dassault Aviation.



## 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

### LANGUAGE REQUIREMENTS FOR ALL MASTERS



(including for Masters taught in French)

TOEFL  
(IBT)

or

TOEIC

or

IELTS



88 points  
(Inst. code: 9820)



785 points



6.5 points

or

CAE/FCE

or

Linguaskill



170 points



170 points

NOTA BENE : Volume of teaching hours and contents of the programs are provided for information only and are subject to change.

### LANGUAGE REQUIREMENTS FOR MASTERS IN FRENCH



#### Language qualification requested

Score B2-Common - European Framework of Reference for Languages

### ■ SELECTION AND ADMISSION

Selection and admission are made by an admission committee :  
Possible interviews can be organized if necessary

#### Deadlines for application:

Applications open in October 2021

for a start of classes in September 2022.

Several admission committees are scheduled from January to July, see schedule on our website

#### Application website :

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

#### Funding

Information on tuitions fees and funding on our website



### Your contacts

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