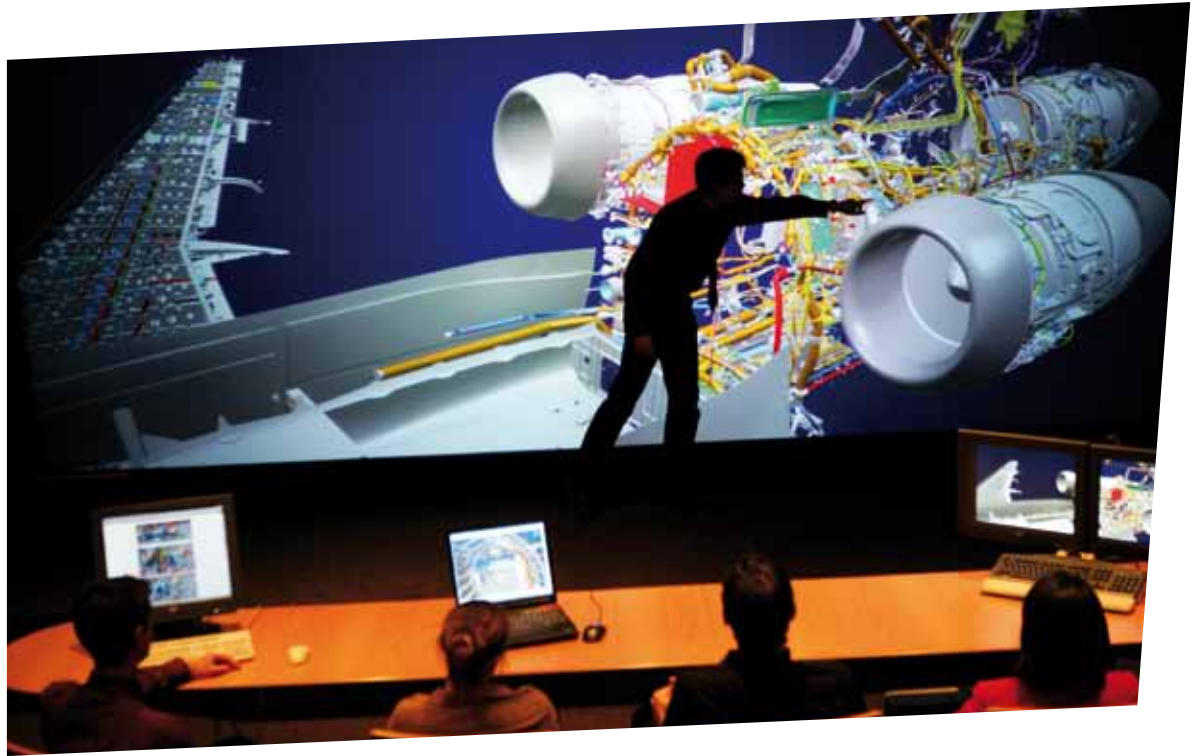


# Aeronautical Engineering

MS TAS Aero



## Aims

The specialized master TAS Aero program leads to a one-year professionally-oriented master's degree with an emphasis on Aerospace Engineering (AE). For some students having a passion for the flight testing, the master TAS Aero offers a Flight Test Engineering major (TAS Aero – FTE).

The MS TAS Aero allows students to develop a high level of competence in engineering science, current technology, engineering design and management of aeronautical systems, or flight test performances. The TAS - Aero programs are highly multidisciplinary and aimed at developing engineering skills to easily enter the work world with great opportunities and significant chances of advancement on aeronautical projects, either in a research facility or in a company in a multinational environment.

The programs are specially designed for students starting immediately after the completion of their master and for industrial employees who have enrolled through their companies' continuing education programs.

The TAS Aero curriculum includes a broad spectrum of

subjects with the following objectives:

- > to develop an integrated approach of the product design development, while acquiring necessary skills in the disciplines and techniques of the aeronautical sector,
- > to easily work on multidisciplinary projects in aeronautics with a very practical approach,
- > to develop skills in team building and team process at a multinational level,
- > to develop project-management and programme management skills for international use,
- > to understand the global economic environment of the aeronautical sector.

In 2011, a new major is created in Flight Test Engineering. The focus of this major – TAS Aero – FTE, is on the more applicable concerns of the subject which will be encountered during the development and certification of new aircraft, by manufacturers of aircraft or equipments.

This major TAS Aero – FTE is aimed at engineers entering this exciting field with little or no prior experience of the subject, and those whose work in other branches of aeronautics requires them to have an appreciation of the issues involved.

# Advanced Master in engineering

with a Flight Test Engineering option

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Graduates of this master are capable of working in flight test department to contribute to various flight testing (certification tests, envelope expansion, performances, handling qualities and aircraft systems...)

## Organization

### Heads of Program:

> Prof. Alain LACOMBE

**E-mail:** alain.lacombe@isae.fr

> Christian COLONGO

**E-mail:** christian.colongo@isae.fr

**Duration of studies:** One year full time

**Beginning of classes:** September

**Location:** ISAE, Campus SUPAERO

**Teaching language:** English

## Pedagogical approach

**First semester:** academic session of around 480h, provided by ISAE's permanent professors and experts from aerospace industry bringing current knowledge and experience, including:

- > lectures, exercises,
- > labs with Matlab,
- > engineering and design study seminars,
- > laboratory sessions,
- > written report and oral presentation,

- > practical sessions,
- > team work and team business game,
- > in-flight practical study and industrial visits (Airbus, CEAT, etc.).

**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 organisation and from ISAE. The thesis is concluded by the preparation of a report and an oral dissertation in front of jury.

Details in following pages

## Career opportunities

More than 1100 students from 55 countries have been trained over the last 30 years and now work as research engineers, designers, project managers, program managers, and consultants, etc.

### Companies recruiting our students

Altran, Aeroconseil, EADS Airbus, EADS Eurocopter, EADS Astrium, ATR, Aéroconseil, C&D Aerospace, Ariel industries, Dassault Aviation, Hurel Hispano/Aircelle, Labinal-Comecad, Latécoère, Mazeret Aviation, Sagem, Liebherr Aerospace, SAMP, SEGIME, ESA/ASTEC, CNES, DGA (French MoD), Brussels Airlines Fly (Belgium), Cenaero (Belgium), CTA (Brazil), Embraer (Brazil), Bombardier (Canada), AVIC (China), COMAC (China), Hal (India), Chilean Air Force, Indian Air Force, Mig (Russia), RUAG AEROSPACE (Switzerland), TUNIS AIR (Tunisia), Exa Corp (USA), Venezuela Air Force,...

## WITNESS

**Sabine MALTAVERNE, France, Graduated in 2009, is now working at Snecma located in Gennevilliers, as engineer.**

**Why did you choose ISAE for your specialized master?**

«Only ISAE proposes a specialized master in aeronautics which relates to technical subjects rather than business. Master courses took place at the SUPAERO campus. This allows us to enjoy its famous status.

**What advice would you give to someone considering the course in order to succeed in their studies?»**

«To take into account all the courses, work on the exams given during the years before, work with people of the engineer cycle and resist to the stress».

**What has the course brought you, what have you gained through the master s' course?**

«I improved my experience concerning general courses and I got a first theoretical teaching in the aeronautics field».

**Has the master TAS Aero helped you in your current or past job?**

«Of course. The specialized master is responsible for my presence in Eurocopter. In this company, my work begins rapidly because of helicopters' courses that I followed at ISAE. I got self-confidence to propose ideas and guidelines in a project frame because of the many examples studied during specialized master. Furthermore, I can deal more easily with theoretical aspects».

# Aeronautical Engineering

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## Syllabus structure

Detailed Program	Hour	TAS Aero - AE	TAS Aero - FTE
<b>ISAE Information System User Introduction</b>	2,50	X	X
<b>STRUCTURES</b>			
Structures standardisation	7,50	X	
MATLAB standardisation	5,00	X	X
Aircraft Structures	46,25	X	X
Composites Standardisation	2,50	X	X
Composites	18,75	X	X
Modeling for aeronautical structures	21,25	X	
Materials for Aerospace structures	22,50	X	X
Computer Aided Design (CAD)	18,75	X	X
<b>FLIGHT TECHNIQUES</b>			
Aircraft Techniques	28,75	X	X
Flight Dynamics 1	33,75	X	X
Flight Dynamics 2	22,50	X	X
Helicopters	22,50	X	X
Control and avionics	28,75	X	X
<b>AERODYNAMICS and PROPULSION</b>			
Aerodynamics 1	23,75	X	X
Aerodynamics 2	17,50	X	X
Propulsion	26,25	X	X
<b>AERONAUTICAL PRODUCT DESIGN</b>			
Aeronautical Engineering environnement	21,25	X	
Mastery of Aeronautical Products	38,75	X	
Integrated Team Project	23,75	X	

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<b>ELECTIVE LECTURES : 1 of 2 to be chosen</b>				
Advanced Structural Dynamics	21,25	X		
Propulsion 2	20,00	X		
<b>Aviation regulations CS/FAR 23 &amp; 25</b>	5,00		X	
<b>Flight test technics and methods</b>	21,15		X	
<b>Human factors in aeronautics</b>	11,00		X	
<b>Flight test experimentation</b>			X	Airplane
Flight test general presentation	6,15		X	
Pitot static calibration, cruise performance	2,30		X	TB20
Tower fly-by	2,30		X	DR400
Climb performances	2,30		X	DR400
Controllability Maneuverability	5,45		X	TB20
Static and dynamic stability	1,15		X	
Longitudinal static and dynamic stability	3,45		X	TB20
Elevator force in maneuver, maneuvering stability	3,45		X	TB20
Lateral and directional static and dynamic stability	3,45		X	TB20
Lateral coefficients identification (telemetry)	1,25		X	TB20
Engine failure	5,00		X	CASA 212
Stall and spin	5,00		X	TB20
Spin demonstration	3,45		X	CAP 10
Spin demonstration (telemetry)	0,30		X	PC7 Pilatus
Acceptance flight	4,45		X	TB20
<b>Team project</b>				
Elaboration of a flight test program	15,00		X	
Evaluation flight	1,30		X	TB20

# Common ISAE's admission procedures

## Advanced Masters in engineering

### Academic requirements

Applicants must have a Master degree, or an equivalent degree in science or engineering, or a bachelor degree with 3 years of professional experience at least

**TAS Aero-AE\*:** Tuition fees: 12500 €

**French and European Students:** 6500 € (students graduated in the year of enrolment or the year before and with no professional experience)

\* Possibility of studies funding by the Midi Pyrenees Regional Council for French and UE unemployed applicants

**TAS Aero - FTE:** Tuition fees: 18000 €

**French and European Students:** 12000 € (students graduated in the year of enrolment or the year before and with no professional experience)

## Selection and admission

### Admission to ISAE's master at:

<http://AdmissionsMasters.isae.fr>

### Selection and admission are made by an admission committee:

> possible interviews can be organized if necessary

### Deadlines for application:

> several admission committees scheduled from March to July 2012, see schedule on our website: [www.isae.fr](http://www.isae.fr)

### Application fees:

> 65 € (non-refundable)

## Language qualification requested

- > TOEFL (Paper-based): 550,
- > TOEFL (IBT): 79,
- > TOEIC: 750,
- > IELTS: 6.0,
- > CAE Cambridge, ...

## Your contacts at ISAE

> **Laurence BALLARIN**, Senior Admission Advisor

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# ISAE in few words

The "Institut Supérieur de l'Aéronautique et de l'Espace" (ISAE) was created in 2007 from the merger of the two prestigious French postgraduate schools of engineering, SUPAERO and ENSICA. Today, ISAE, is a world-class higher institute for aerospace engineering education and research. Nowadays with a student corpus of over 1500, ISAE is one of Europe's largest Aerospace Institute offering graduates and postgraduates programs. Yearly, ISAE awards around 20% of master's degrees in Europe in aeronautics and space field. ISAE develops its worldwide reputation on the prestige of its master's programs, the fame of its teaching staff, or the excellence of its research but also on the high-value of its graduates, their skills in engineering or management, as well, their capacity to evolve within a very high-technology environment, their enterprising mind and international opening.

## Key figures

- > 2 Graduate Engineering Programs: SUPAERO and ENSICA
- > 15 Specialized Masters including 11 in English
- > 3 Masters of Science
- > 6 Research Masters
- > 6 PhD Programs
- > 1500 students (1300 masters and 200 PhDs more or less)
- > 160 international cooperation opportunities
- > 50 academic and research partnerships

## Identity card

**Name:** Institut Supérieur de l'Aéronautique et de l'Espace (ISAE)

Founded in 2007 - as the result of the merging of SUPAERO (1909) and ENSICA (1945)

**Legal Status:** A large public institution of scientific, cultural and vocational missions

**Trustees:** Délégation Générale pour l'Armement (DGA) [French Defence Procurement] - Ministry of Defense

**Endorsements and awards:** CTI agreement of the two Graduate Programs, Conference des 'Grandes Écoles', for postgraduate specialized masters Ministry of Higher Education and Research for Masters of Science

**Staff:** 420 permanent staff



## Contacts ISAE

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**Web site:** [www.isae.fr](http://www.isae.fr)