



MASTER IN AERONAUTICAL ENGINEERING



Erasmus+



Polytechnic Institute of Advanced Sciences | School authorised to award the title of engineer



Francis Pollet

General Director

"Discovering French aeronautical and space know-how is a major asset for a future master's degree.

Accredited by the French Ministry of Higher Education, Research and Innovation, the IPSA Master's degree opens all the doors of global industry.

The requirement and mastery of the best technologies make it possible to achieve a very high level of competence.

The IPSA is at the gates of Paris, which offers a cultural space of the highest level.

You can choose between 3 fields:

vehicles (aerodynamics, propulsion structures and materials), space and systems (fly by wire, telecom, mechatronics)."



IPSA, AN AERONAUTICS & SPACE GRADUATE ENGINEERING SCHOOL IN FRANCE



IPSA is an engineering school offering a 5-year syllabus 100% dedicated to Aeronautics and Space.

The interest in 'everything Aerospace' is a particular source of motivation in the school and the passion is shared by both students and lecturers.

Since its creation in 1961, IPSA has been driven by the constant concern to match the training provided to students with the needs of companies. Thus the Master programme is composed of majors and options which constitute axes of deepening essential to the acquisition of solid knowledge in their field. These developments have always been guided by the work of the school's development council.

The "diplôme d'ingénieur", equivalent to a Master in aeronautical engineering awarded by the IPSA places the graduate as able to tackle any problem related to aeronautics and space. IPSA training also allows graduates to work in related advanced fields of aeronautics and space, particularly in land transport, which uses techniques and technologies similar to those used in aeronautics.

IPSA is accredited by the "Commission des Titres d'Ingénieurs" (CTI, accreditation body for the French engineering schools) and holds the EUR-ACE® label and is part of the IONIS Education Group.

<https://www.ionis-group.com/>



WHY STUDY

#1

A sophisticated research enterprise

France ranks sixth in the world in terms of domestic spending on research and development. 16 of 55 Fields medals have been awarded to French nationals. 41.1% of the doctoral candidates in France are internationals.



#2

A world-class economic power

France has the world's five-largest economy. Its gross domestic product ranks second in Europe, and the country is Europe's second largest market (IMF, 2014; Eurostat, 2014).



#3

An appealing destination for international students

France is the world's 4th leading country for international students after the United States, the United Kingdom, and Australia (UNESCO, 2014).



#5

A pleasant and satisfying style of life in the heart of Europe

Situated in the very heart of Europe, France is the world's top tourist destination in terms of number of foreign visitors (UNWTO, 2014). Paris is ranked the world's second best city for students (QS Best Student Cities, 2017).

#4

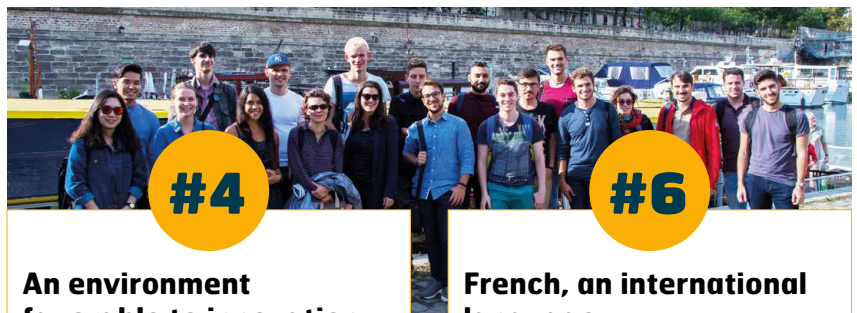
An environment favorable to innovation and to young entrepreneurs

France is home to more of the world's top 100 most innovative companies than any other country in Europe (Thomson Reuters 2016). It ranks sixth in the world in number of international patent applications (WIPO, 2013)

#6

French, an international language

French is the world's fifth most widely used language, with 274 million speakers. After English, French is the most widely studied language in the world. It is the world's third most common business language and second most common language of international news (OIF, 2014).



IN FRANCE ?



#8

France is one of the leading countries in the field of aerospace

Paris and Toulouse are the ideal cities for those passionate about aeronautics in industrial terms (with Airbus, Alcatel, Astrium, Thalès, Safran, etc) and in research with CNES, ONERA and numerous CNRS laboratories.
(Source : CampusFrance, 2017)



#7

Advanced industries and international corporations that are leaders in their field

France is home to 31 of the world's 500 largest corporations (Fortune Global 500, 2014)



FRENCH KNOW HOW IN AEROSPACE

The French aerospace industry is precisely the second largest in the world, behind the United States and ahead of China, with a turnover of 69 billion dollars in 2017.

The position of the French aerospace industry, which is at the forefront of the world, is partly due to the success of prime contractors and a policy of industrial alliances, which have been able to win markets with complete products, but also markets of equipment manufacturers and subcontractors, to position themselves with foreign manufacturers

The success of the French aeronautics industry also depends on the quality of the human skills in France, both in the design offices and in the assembly plants. Its needs for engineers, management engineers and qualified technicians are significant.

IPSA curriculum of our Master degree fully meets the future expectations of French and world industry in the aeronautical field.

IPSA IN FIGURES

+65
partner
universities



+3000
alumni

+1700
students
on 2 campuses :
Paris Ivry
and Toulouse



+200
partner
industries

40
student
associations

100%
of students
hired within
3 months
after graduation



28
weeks
mandatory
final internship

OUR CURRICULUM

IPSA Bachelor program (3 years) is taught in French in Paris and Toulouse (more campuses to open) and initiates students into the aerospace field.

The subjects studied are Mathematics, Physics, Aeronautical sciences, Computer sciences and Electronics. In their 3rd year, students can specialize in aerospace systems or aerospace vehicles.

Our Master program (2 years) is fully taught in English (only in Paris). During these 2 years, students can individualize their courses through options and scientific majors (Energy and Propulsion, Mechanics and Aircraft Structures, Embedded Systems, Mechatronics, Space launchers and satellites, etc).

SEMESTER 7	SEMESTER 8	SEMESTER 9	SEMESTER 10
30 ECTS	30 ECTS	30 ECTS	30 ECTS
Common core and specializations	Common core and specializations	Common core and options	End of study Internship
Vehicles or Systems	SET: Embedded Systems and Telecommunications	SAA: Autonomous airborne systems	In a company
	SM: Mechatronic Systems	TIE: Embedded information management and processing	
	EP: Energetics and Propulsion	CAE: Airframe and materials	
	MS: Mechanics and Structures	EMO: Energetics and Engines	
	ELS: Space, Launchers and Satellites	ELS: Space, Launchers and Satellites	
		MPI: Management des projets industriels (taught in french)	
		MPM: Management de la Production et du MCO (taught in french)	

SEMESTER 7

MODULES	SUBJECTS
Cultural integration	Intensive French language courses
	Getting over culture shock and going beyond national stereotypes
Common core	Probability and Statistics for Engineering
	Linear and Continuous Systems Design
	Linear Systems State Space Representation
	Perfect Fluid Dynamics
	Introductory Course in Avionics
	Human sciences
Specialization	<p>Vehicles :</p> <ul style="list-style-type: none"> • Introduction to Mechanical Vibrations and Structural Dynamics • Real Fluid Dynamics <p>Systems :</p> <ul style="list-style-type: none"> • Digital Control System Design • Microcontrollers and their applications

SEMESTER 8

MODULES	SUBJECTS	MAJORS
Cultural integration	French language programme for engineers	
Common core	Engineering sciences	
	Electives modules	
	Introducing Project to Research or Innovation (PIRI)	
	Human Sciences	
	Business exposure	
Specialization	<p>Vehicles:</p> <ul style="list-style-type: none"> • Fluids dynamics • Numerical calculations in mechanics and structures (FEM) • Energetics and sustainable design 	EP: Turbomachine design, thermal motors or drone and light aircraft, Behavior law for materials
		MS: Aircraft structures design, Composite materials, CAD CATIA, Behavior law for materials
		ELS: Space mechanics, Space optics, Plasma physics and propulsion
	<p>Systems:</p> <ul style="list-style-type: none"> • Complex information systems modelling <ul style="list-style-type: none"> • Real time systems • Embedded networks • Physical approach to aeronautical automated systems 	SET: Advanced applications of RPGA circuits, Telecommunications, Guide propagation and hyperfrequencies
		<p>SM: Power electronics in aeronautics, Guidance principles of autonomous systems, Swarm intelligent systems, Introduction to robotics</p> <p>ELS: Space mechanics, Space optics, Plasma physics and propulsion</p>

SEMESTER 9

MODULES	SUBJECTS	OPTIONS
Common core	<ul style="list-style-type: none"> • Human Sciences • Corporate knowledge • Ethics 	
Specialization	Vehicles: <ul style="list-style-type: none"> • Hypersonic aerodynamics introduction • Reliability and fatigue of structures • Computational Fluid Dynamics (CFD)" 	CAE: Vertical flight, Calculations of structural materials, Finite Element Method (FEM), Multi-body mechanical simulation
		EMO: Turbine engines, Combustion, Aeroacoustics, Turbulences, Alternatives energies propulsion
		ELS: Satellites design, Launchers design, Space propulsion systems, Payload integration and launchers
	Systems: <ul style="list-style-type: none"> • Aircraft modelling • Electromagnetic compatibility and antennas • Systems design and fast prototyping 	SAA: Artificial intelligent control, Intelligent systems, Drones and visual servoing, Nonlinear systems control
		TIE: Embedded systems, Airborne sensors and data transmission, Real-time operating systems, Image processing with RPGA, Aeronautic telecom systems
		ELS: Satellites design, Launchers design, Space propulsion systems, Payload integration and launchers
	Management (taught in french): <ul style="list-style-type: none"> • Cost management • Supply chain • Project management 	MPI: International negotiations, Management control, Risk analysis, Business management simulation
		MPM: Supply chain, Quality management, Production management control, Stock management, Airworthiness

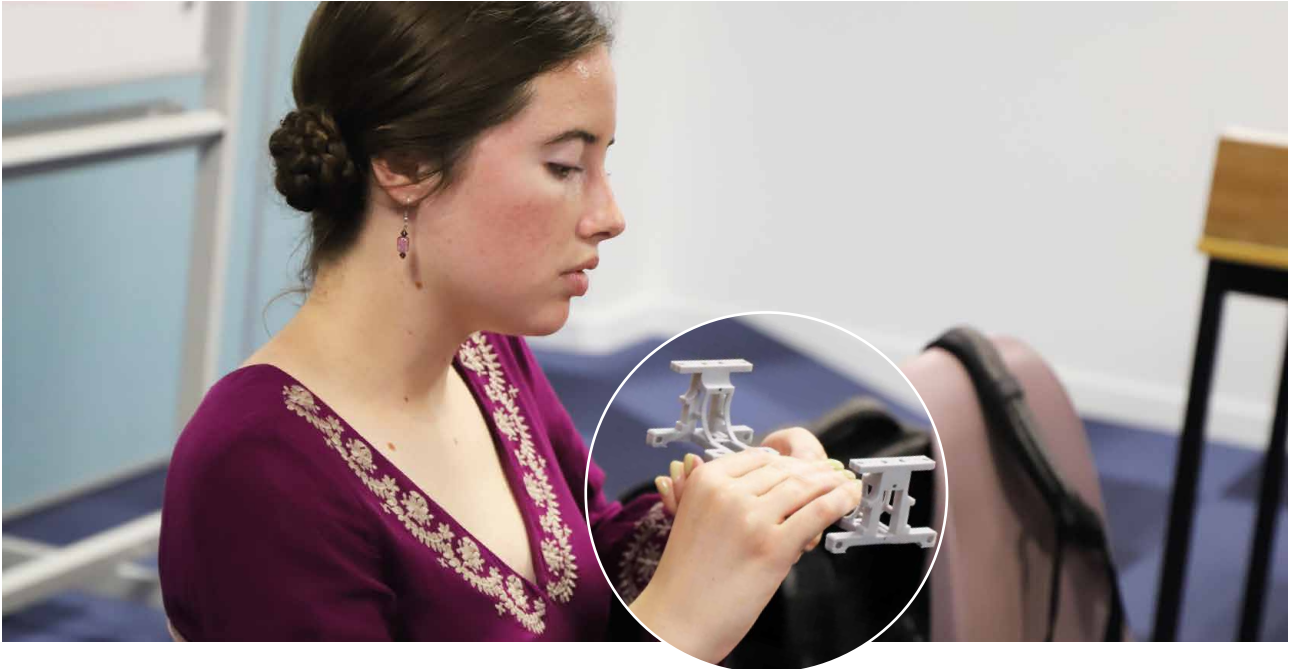
SEMESTER 10

Final 6-month internship monitored by IPSA and Master's thesis presented on-campus in front of the Graduate Committee.



RESEARCH LABORATORIES

At the crossroads of the Industrial and Academic worlds, research is one of the fundamental axes of the IPSA pedagogy. IPSA has 7 research laboratories:



1

**Laboratory
in Autonomous Aerial
Systems (LS2A)**

2

**Laboratory
in Intelligent Systems
(LS2I)**

3

**Laboratory
in Complex Systems
(LSCI)**

4

**Laboratory in Numerical
Simulation and
Calculations (LSNC)**

5

**Laboratory in Thermal
and Thermodynamics
(L2TI)**

6

**Laboratory in Materials
and Structures Mechanics
(L2MS)**

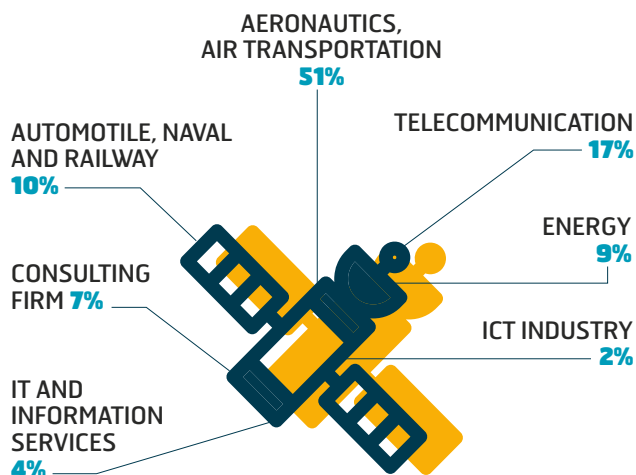
7

**Laboratory
in Aerodynamic testing
and Modelling (LEMA)**

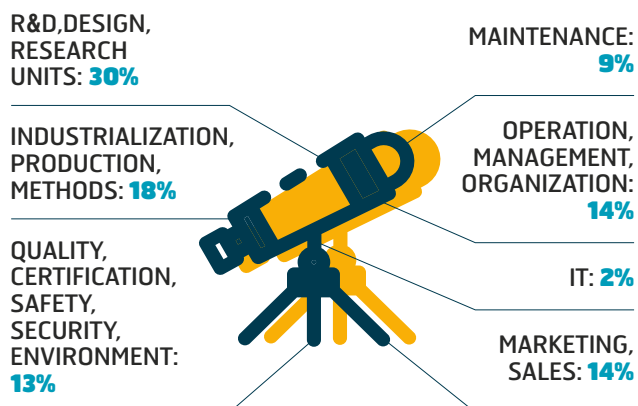


OPPORTUNITIES & CAREERS

COMPANIES' BUSINESS SECTORS



OUR GRADUATES' FIELDS OF ACTIVITY



CLASS 2016, FIRST JOB IN AERONAUTICS AND SPACE

83% of graduates found their first job within three months after leaving school, 68% of them work in the aeronautics and space sectors: constructors, equipment manufacturers, subcontractors and SMEs. Engineering companies are always major recruiters and are well established with clients. Some of them have started their own businesses. The gross annual salary is €39.8k.

COMPANIES WHERE OUR GRADUATES WORK

AÉROPORTS DE PARIS	MATRA ÉLECTRONIQUE
AFD TECHNOLOGIES	MBDA
AIGLE AZUR	MCA INGÉNIERIE
AIR ET COSMOS	NEXTER
AIR FRANCE	NMJ SERVICES
AIRBUS	OBSERVATOIRE DE PARIS
AIRBUS HELICOPTERS	ONERA
AKKA TECHNOLOGIES	OCTONION
ALTEN	PATROUILLE DE FRANCE
ALTRAN	PLANITEC
AMARIS	POTEZ AERONAUTIQUE
ARIANE GROUP	PSA
ARMÉE DE L'AIR	RATP
ASSYSTEM	RENAULT
ATR AIRCRAFT	ROLLS-ROYCE
AUSY	SABCA
AVIATION DESIGN	SABENA TECHNICS
CEA	SAFRAN
CEGELEC	SAFRAN AIRCRAFT
CITÉ DE L'ESPACE	ENGINES
CM DRONES	SAFRAN ELECTRICAL
CNES	& SCALIAN
COMPOSITE INDUSTRIE	POWER SAFRAN
CORSAIR INTERNATIONAL	HELICOPTER ENGINES
DAHER AEROSPACE	SAFRAN LANDING SYSTEMS
DASSAULT DS	SAFRAN NACELLES
DASSAULT FALCON	SAFRAN TRANSMISSION
SERVICE	SYSTEMS
DAVIDSON CONSULTING	SEGULA TECHNOLOGIES
DEDIENNE AEROSPACE	SNCF
DERICHEBOURG	SOGÉCLAIR AEROSPACE
AEROSPACE	SOGETI HIGH TECH
DGAC	SONOVISION LIGERON
DIRECTION GÉNÉRALE DE	SOPRA - STERIA
L'ARMEMENT	STELIA AEROSPACE
DRONE VOLT	STUDEC
ECM	THALES
EMBRAER	TRANSAVIA
INSTITUT JEAN MERMOZ	TRIGO-QUALITAIRE
KUEHNE NAGEL	UTC AEROSPACE SYSTEMS
LATÉCOÈRE	VALEO
LIEBHERR AEROSPACE	WIJET
LISI AEROSPACE	

INSTITUTIONAL PARTNERS

3AF	ELLES BOUGENT
AEROSPACE VALLEY	EUROSPACE
ACADÉMIE DE L'AIR	ISSAT
ET DE L'ESPACE	RAES
APEC	UFH
ASTECH	

OUR CAMPUS

IPSA Paris is located on the Paris Ivry technology campus of the IONIS Education Group, which also includes ESME Sudria, a general engineering school, and ETNA, a computer science school on an work and study basis.

The 10,000m² premises consist of:

- Classrooms
- Innovative and connected laboratories
- Associative rooms
- Living and dining areas

The clustering of these schools on the same campus makes it possible to develop collaborations based on the fields of specialization of each of them and contributes to the students' open-mindedness.

Proximity to these schools thus takes different forms:

- Organisation of joint events
- Collaboration on associative projects

Located 10 minutes from the capital, students benefit from the cultural and economic dynamism of Paris and its region, for their extracurricular activities and their professional integration.



STUDENT LIFE

The passion and the dynamism of of IPSA students materializes through student associations. Whether they are of a cultural, sporting or technical nature, the students lead innovative, sometimes ambitious projects, where technological venture is at stake. Design and launch of rockets or drones, construction of a full size flight simulator for a Boeing 777, pilot training, model airplanes, but also music, team sports, video and many other things...
IPSAliens student life is full of passion.

OUR ASSOCIATIONS

IN PARIS

• **BDE IPSA:**
Animation of student
life by the Students
Association

• **Bureau
des Sports:**
Sports
Association

• **Aéro IPSA:**
Design and build
of experimental
rockets

• **IPSA
Technologies:**
Design and build
of drones

• **Evolutek:**
Robots

• **IPSA Flight:**
Construction
of a flight simulator
for a Boeing 777


• **Mach 0.1:**
Flying gliders

• **IPSA KART:**
Karting

• **Bureau
des Arts:**
Cultural events

• **STUD'ACT:**
Humanitarian
and solidarity
Actions

ACCOMMODATION



IPSA doesn't have dormitories.
However we have an online platform to help students. To find an accommodation.
This platform gives access to a wide selection of offers from residences and private owners. It also gives access to a multilingual team available 6 days a week to help with the documents, the financial help, etc.
The support team from the online platform can assist the students with the procedure as well as their "IPSA buddy".

<https://logement.ipsa.fr>

Finding an accommodation in Paris can be quite difficult, especially at the beginning of each semester.
We do recommend to search for an accommodation as early as possible.

HOW TO **APPLY ?**

ELIGIBILITY

Our Master of Engineering is open to candidates holding a 3-year bachelor's degree (or equivalent) in Aerospace Engineering, Mechanical Engineering, Electrical and Electronic Engineering, Mechatronic Engineering or related fields.

Application documents must be sent to **freemover@ipsa.fr**

All documents must be in French or English, in pdf format.

- Curriculum Vitae
- Official university transcripts
- Certified copy of your Bachelor's degree
- 2 letters of recommendation
- Copy of passport
- TOEFL 79, TOEIC 785, IELTS 5,5 or Cambridge BULATS record results
- ID photo
- Statement of purpose
- Proof of payment of the application fee

Admission upon application, possibly with an interview on skype.

FEES PER ACADEMIC YEAR

Application fee : 110 euros

Registration fee per year : 990 euros

Tuition fee per year : 9 135 euros

APPLICATION DEADLINE :

May 15th





CONTACT US

IPSA

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freemover@ipsa.fr

IPSA is located in the South East of Paris. It is easily accessible by road and public transports.



www.ipsa.fr



ABOUT IONIS EDUCATION GROUP

Created in 1980 by Marc Sellam, the IONIS Education Group is the first group of private, higher education in France. The 25 schools and entities of the Group bring together nearly 28,500 students and 75,000 alumni in the fields of business, marketing, communication, management, finance, information technology, digital, aerospace, energy, transport, biotechnology and innovation. The self-defined mission of the IONIS Group is to bring forth new business intelligence today and tomorrow. In 2017, the IONIS Group is expanding its borders with the creation of interdisciplinary urban campuses in foreign metropolises (Barcelona, Berlin, Brussels, Geneva and soon New York City). Strong international scope, attachment to innovation, entrepreneurial spirit, and veritable "culture of adaptability and change", these are the main values taught to the future alumni of the IONIS Group - key actors in tomorrow's economy.