



PARIS-CACHAN CAMPUS

MAJOR



Aeronautical Engineering & Space Systems

#HELICOPTER #AIRPLANE #AERODYNAMICS #SATELLITE #DRONE
#CONCEPTIONMECHANICALDESIGN #OPERATION-MAINTENANCE
#INDUSTRIALISATION-PRODUCTION #PROPULSION #LAUNCHERS
#COMPLEXSYSTEMSENGINEERING #EMBEDDEDSYSTEMS



ENGINEERING SCHOOL
Creating the future together



COURSE OBJECTIVES

This major has been developed to prepare general engineers with a sound knowledge of the aeronautics and space sectors, combined with a high level of expertise in systems engineering for a structured, multi-disciplinary approach to design and integration.

By following a systems approach, you will acquire a wide range of skills on all aspects of the design of an aeronautical or space vehicle.

COURSE DESCRIPTION

The Major in Aeronautical Engineering & Space Systems spans two academic years structured around two academic semesters and two semesters of internships: a student-engineer internship in Year 4 and a 'final year project' internship in Year 5.

During this major, you will pursue the engineering career profile of your choice by following one of the **three specialist tracks on offer in Year 5:**

- ▶ Study & Design
- ▶ Industrialization & production
- ▶ Operations & maintenance

All three tracks are designed to introduce you to the full range of engineering professions associated with the aeronautics and aerospace sector.

YEAR 4 . COMPULSORY MODULES

General knowledge	64 hours 5 ECTS
<ul style="list-style-type: none">• Employment law• Business Game• Statistics for engineers• English	Develop a knowledge and practical understanding of the key tools for engineering responsibilities.
Digital technologies	64 hours 5 ECTS
<ul style="list-style-type: none">• Complex technical project management• Applied systems engineering• Product Lifecycle Management (PLM)• Operational safety• Conferences	Understand and know how to implement a system approach. Understand the design process of an aircraft or a launch vehicle.
Aeronautical & space systems	64 hours 5 ECTS
<ul style="list-style-type: none">• Introduction to aeronautics• Introduction to space systems• Helicopter systems• Satellite systems	Develop a knowledge and understanding of the challenges of aeronautics and space systems.
Applied mechanics	64 hours 5 ECTS
<ul style="list-style-type: none">• Space mechanics• Flight mechanics• Fundamental aerodynamics	Understand the performance of an aircraft or launch vehicle.
Structure & materials modeling	64 hours 5 ECTS
<ul style="list-style-type: none">• Structural design (Finite Element Method)• Structural dynamics• Composite materials	Know how to analyze the behavior of a structure in static and dynamic terms to design it. Know how to pre-design a structure made of composite material.
Engineering system project	150 hours 5 ECTS

YEAR 5 . COMPULSORY MODULES

Systems design	64 hours 5 ECTS
<ul style="list-style-type: none">• Onboard equipment• Launch vehicle electrical system and software• Guidance, Navigation & Control (GNC)• Avionics	Become familiar with control and equipment systems.
On board energy	64 hours 5 ECTS
<ul style="list-style-type: none">• Satellite electric systems - plasma propulsion - space systems - aeronautics	Know how to analyze and describe onboard energy systems.
Engineering system project (drone)	115 hours 4 ECTS
Business Engagement & Networking	1 ECTS

YEAR 5 . OPTIONAL MODULES . 1 TRACK TO CHOOSE FROM

. STUDY & DESIGN TRACK

General knowledge	64 hours 5 ECTS
<ul style="list-style-type: none">• Fatigue - Damage tolerance• Structural dynamics (experimental and digital)• Aerodynamics (experimental and digital)	Be able to design and dimension mechanical systems.
Systems design II	64 hours 5 ECTS
<ul style="list-style-type: none">• Advanced systems control• Testing and instrumentation	Be able to design embedded systems.
Project: preliminary draft aircraft design (or launch vehicle design)	150 hours

. INDUSTRIALIZATION & PRODUCTION TRACK

Industrialization	64 hours 5 ECTS
<ul style="list-style-type: none">• Factory of the future• Industrialization• ERP	Understand the challenges and processes of industrialization.
Production	64 hours 5 ECTS
<ul style="list-style-type: none">• Additive Layer Manufacturing (ALM)• Industrialization techniques and associated special processes• Industrial project management and operational management• Quality management	Industrial techniques and associated special processes. Industrial project management and operational management. Quality.
Project: preliminary draft design of an industrial site	150 hours

. OPERATIONS & MAINTENANCE TRACK

Operations	64 hours 5 ECTS
<ul style="list-style-type: none">• Air operations• Space operations	Develop knowledge of air and space operations and associated regulations and certifications.
Maintenance	64 hours 5 ECTS
<ul style="list-style-type: none">• Aeronautical maintenance & regulations• Integrated Logistics Support (ILS)	Understand the implications and regulations relating to maintenance.
Project: preliminary draft of the creation of a new airline	150 hours

YOUR FUTURE AFTER THE AERONAUTICAL ENGINEERING & SPACE SYSTEMS MAJOR:

GROWTH SECTORS

- The leading French, European and world aeronautics and space manufacturers
- Partner companies and equipment manufacturers of aerospace manufacturers
- Engineering and technology consulting companies
- Public or private research organisations in the aeronautics - space - defense sector
- Companies in charge of the scientific and technical aspects of air traffic and transport management and planning
- Companies in charge of satellite operations
- Airline companies
- Cargo companies
- Aeronautical maintenance companies
- Airport companies

JOBS OF THE FUTURE

- Technical design office engineer
- Aeronautical and Space systems engineer
- R&D engineer
- Technical and commercial engineer
- Cross-functional project manager engineer
- Aeronautical maintenance engineer
- Aeronautical and space operations engineer
- Operations engineer
- Industrialization engineer
- Flight test engineer

REAL-WORLD PROJECTS TO DEVELOP YOUR EMPLOYABILITY

- ▶ Systems engineering project in Year 4
- ▶ Drone project in Year 5 (advanced systems engineering)
- ▶ Careers project in Year 5



A DOOR TO THE PROFESSION OF AIRLINE PILOT

EPF has signed an agreement with *Aéropyrénées* allowing students to prepare the ATPL* theory during the major at a reduced cost.

*ATPL : Airline Transport Pilot Licence



Ryan NKENFACK

2021 Graduate

“ The Aeronautical Engineering & Space Systems Major prepares students for jobs in the aeronautical and aerospace industries, enabling them to acquire in-depth skills in the design, operations and maintenance aspects of aircraft. I chose this major firstly out of a passion for aeronautics, but also because the knowledge I acquired in fluid and structural mechanics had practical applications in this sector of activity.

I was also able to put them into practice during academic projects, particularly the design and manufacture of a drone, during which you have to work in a team and make relevant and justified technical choices. Today I'm delighted to have made this choice, especially as during my last year I completed a double degree programme in Aerodynamics as part of a partnership between EPF and Sorbonne University. ”

PRACTICAL DETAILS

- **Duration of studies:** 2 years
- **Location:** Paris-Cachan Campus

ANY QUESTIONS?

Odile TISSIER

odile.tissier@epf.fr

Romain RUYSSSEN

romain.ruyssen@epf.fr

CAMPUS DE PARIS-CACHAN	55 av du Président Wilson, 94 230 Cachan. +33 (0)1 41 13 01 51
CAMPUS DE TROYES	2 rue Fernand Sastre, 10 430 Rosières-près-Troyes. +33 (0)3 25 70 77 19
CAMPUS DE MONTPELLIER	21 boulevard Berthelot, 34 000 Montpellier. +33 (0)4 99 65 41 81
CAMPUS DE SAINT-NAZAIRE	24 avenue Léon Blum, 44 600 Saint-Nazaire. +33 (0)2 30 79 06 00
CAMPUS DE DAKAR	Sacré cœur 3 N° 9369, sur la VDN, Dakar. +221 78 295 73 73