



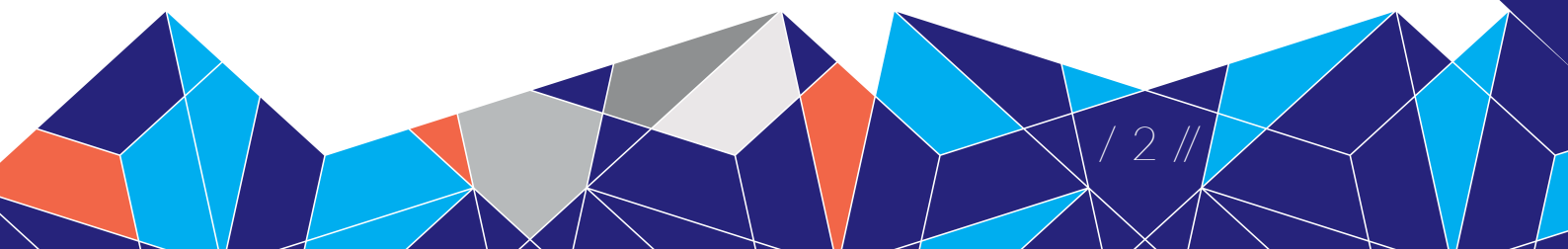
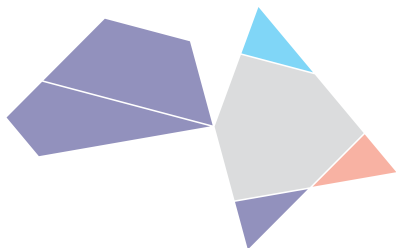


MS **Advanced Masters:** 1 semester courses
+ professional thesis 75 ECTS

PGDip **PG Diplomas:**
1 semester courses 45 ECTS

CAS **Certificates of Advanced Studies:**
from 44h to 102h provide ECTS

Short courses: from 12 to 51h



About ISAE-SUPAERO

Executive Education



ISAE-SUPAERO has been at the forefront of aerospace innovation since 1909. We have trained more than 22 000 engineers, who are contributing to the development of the aeronautics and space sector around the world. Our engineers' vocation is to become future leaders in the aerospace industry and the world of tomorrow. We have developed an integrated approach with training, research and innovation in partnership with industrial stakeholders and a network of the best international universities.

ISAE-SUPAERO Professional Education stems from our 15 Advanced Master Programs. This one-year degree of professionally-oriented advanced studies relies on close ties with industry professionals. It is therefore highly valued on the job market and graduates are unique because of their specialised knowledge and experience of a certain field.

Thanks to its close links with the aerospace industry, ISAE-SUPAERO develops an innovative training offer to prepare highly employable experts, in response to the growing demands of this industry.

Professionals from around the world come to ISAE-SUPAERO to experience our on-campus courses, including certificates of advanced studies and short courses.

Our professional development courses provide highly targeted learning to develop career-enhancing skills, which are delivered by experts in the fields of Aeronautics, Space, Systems Engineering, Project Management and Digital.

On-campus courses combine theoretical and research-based knowledge with practical hands-on experience and unmatched networking opportunities.

Our certificates and short courses offer an opportunity for working professionals to enroll in traditional ISAE-SUPAERO classes. Select from tens of ISAE-SUPAERO courses and learn alongside our faculty and students.

Our courses explore wide-ranging topics and are led by prominent ISAE-SUPAERO faculty, who are internationally recognized in their respective fields.

Didier Delorme
Dean of Masters programs

Advanced Masters (Mastère Spécialisé®)

& Postgraduate Diplomas



Project Management

MS / **APM, Aerospace Project Management**
(with ENAC & Ecole de l'Air)

Economics and finance,
Knowledge management
in multicultural team project.

MS / **MGPIE, Management de Projets Innovants et Entrepreneuriat**
(taught in French)

Project management, strategic
planning, Lean methods,
leadership, market studies,
business model design,
intrapreneurship.



Space

MS / **TAS ASTRO, Space Systems Engineering & Space Exploration**
PGDip
Missions & systems, Space programs
sub-systems: satellites & launchers.

MS / **SPAPS, Space Applications and Services** (with Airbus Defence & Space)
PGDip
Satellite-based earth observation
applications and services,
Space telecommunications
and services, Navigation,
Space legal and
business issues.



Digital

MS / **AIBT, Artificial Intelligence and Business Transformation** (with TBS Education & IRT Saint Exupéry)
Data integration, Machine
learning, AI certification,
Business of data.

MS / **EMS, Embedded Systems**
(with INP-ENSEEIH)
Embedded Systems core,
Energy, Networks, Embedded
Systems design, Applications.



For information on tuition fees,
see our website:

www.isae-supero.fr



Manufacturing

MS / AMPAS, Advanced Manufacturing Processes for Aeronautical Structures (with IMT Mines Albi-Carmaux)
 Material and process basic scientific knowledge, Composite structure forming and machining processes, Metallic structure forming and machining processes, Industrial organization and management.

Aeronautics



/ TAS AERO, Aeronautical Engineering, Aircraft Design & Flight test

Structures and materials, Flight physics, Avionics and systems, Aircraft design engineering.



/ HADA, Helicopter, Aircraft and Drone Architecture

Aircraft structures, Aircraft architecture, Fixed-wing aircraft certification, Helicopters & drones.



/ AMS, Aeronautical Maintenance and Support, Engineering & Management (with Airbus Helicopters)

Aircraft general familiarization, Maintenance & health management analysis, Airworthiness, safety and human factors, Customer support, Supply chain and recycling.



/ ASAA, Aviation Safety: Aircraft Airworthiness (with ENAC & Ecole de l'Air)

Aeronautical techniques and study of aircraft systems, Air Transport safety, Airworthiness.



/ AES, Aeronautical and Space Structures

Methods & tools for engineering & dynamics, Aerospace systems architecture, Dynamics & physics, Aerospace program & technologies.



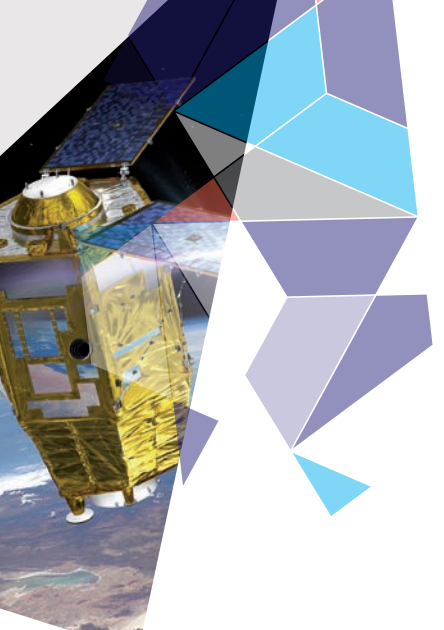
/ IEVEX, Experimental Flight Test Engineering (taught in French, with EPNER)

Flight mechanics, Automatic control and aircraft control, Mathematics, Aerospace technics, Propulsion tests, Embedded-systems tests, Safety of flight tests.



/ SPA, Systèmes de Propulsion Aéronautique (taught in French)

Propulsion systems, Energetics and aerodynamics, Aerothermal and all types of propulsion technologies.



Systems Engineering



/ SEN, Systems Engineering

Systems modelling and analysis, Systems engineering data technical management, Systems dependability, Systems performance assessments & management, Systems design and Architecture.





TAS AERO

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HADA

Helicopter, Aircraft & Drone Architecture
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AMS

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AES

Aeronautical & Space Structures
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AIBT

Artificial Intelligence and Business Transformation
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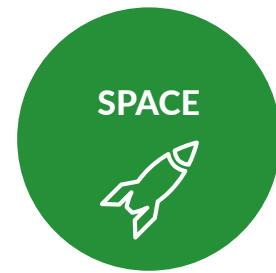


APM

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MGPIE

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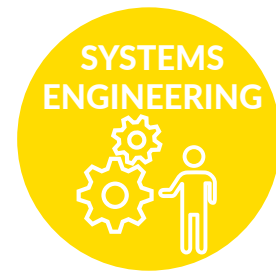


TAS ASTRO

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SPAPS

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SEN

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Preparation to INCOSE ASEP/CSEP certification 29





Our executive education team

You can join her/him if you

info.exed@isae-supero.fr



Thibault Brémaud

*Head of Executive Education
& ECATA administrator*

- Want to discuss a new training need for your staff members
- Are looking for executive education collaborations between your company & ISAE-SUPAERO

+33 5 61 33 80 46



Claire Juaneda

ECATA & Digital learning coordinator

- Look for information about ECATA

+33 5 61 33 81 96



Natalia Perthuis

Executive Education coordinator

- Already know which course you are interested in but look for more information
- Need help regarding funding and administrative issues for your training

+33 5 61 33 80 47



Human Factors

Aeronautics



At ISAE-SUPAERO, I belong to a lab of experts in Human Factors and Neuroergonomics who have been developing cutting edge research since 2015. We use machine learning and algorithms to recognize stress and fatigue, in order to develop real-time crew monitoring methods and innovative systems for designing adaptive cockpits. Our research is closely linked to professional applications and the short courses we offer can be a good opportunity for professionals to better understand human behavior and performance. We use flight simulators and assess pilots' brain activity but the inputs of those courses allow a multi-disciplinary approach that goes far beyond the aerospace sector.

Raphaëlle Roy,
Course Director

The EAAP Board considers these modules to be of very high quality and very important contribution to Human Factors in Aviation.

CAS **HF1 - Human factors and neuroergonomics for aeronautics & transportation (TAS AERO)**

100 h, 6500 €, Raphaëlle Roy
4 short courses: HF400, HF410, HF420, HF430

Objectives: *Multi-disciplinary approach to understand human behavior and performance. Master concepts to design safer and more efficient systems that take the human operator into account.*

HF400 Understanding human behavior (TAS AERO)

25 h, 2300 €, November 2021
Course supervisor: Raphaëlle Roy, ISAE-SUPAERO

Key contents: Nervous system; Vigilance, Fatigue & Rhythms; Perception; Attention & Executive Control; Emotions, Memory & Learning, Decision Making; Application Focuses: Pilot/Autopilot Conflict, Airline Pilot Experience.

HF410 Humans at work (TAS AERO)

25 h, 2300 €, January 2022
Course supervisor: Raphaëlle Roy, ISAE-SUPAERO

Key contents: Cognitive and Physical Ergonomics; Activity Analysis; Crew Resource Management and Reasoning Biases, Social Psychology; Application Focuses: Cockpit Design, Airbus, Dassault and DSNA Human Factors perspective.

HF420 Experimentation and measures (TAS AERO)

25 h, 2300 €, February 2022
Course supervisor: Sébastien Scannella, ISAE-SUPAERO

Key contents: Initiation to Experimentation; Ethics; Eye-tracking; Electrocardiography; Electroencephalography; Near Infra-Red Spectroscopy; Application Focus: Certification, Aviation/Aerospace psychology & medicine.

HF430 Advanced techniques (TAS AERO)

25 h, 2300 €, March 2022
Course supervisor: Raphaëlle Roy, ISAE-SUPAERO

Key contents: Signal processing for physiological data; Statistical Analysis of Experimental Data; Passive Brain Computer Interfaces as tools for Neuroergonomics; Simulator studies; Application Focuses: Experimental work using real light airplanes; Accidentology.



HADA

Aeronautics



The Helicopter, Aircraft and Drone Architecture (HADA) Advanced Master's Program has been jointly designed and developed by ISAE-SUPAERO and Airbus Helicopters. It provides a high-level of engineering and technical skills for careers in the aircraft, helicopter and drone industries.

Our courses and certificates provide skills required for aeronautical engineers (architecture, certification and structures) and specific skills to identify and implement solutions to aircraft, helicopter and drone projects. This program prepares attendees to a wide range of professional opportunities from design, certification and operations of civil and military aircrafts, drones and helicopters in France and overseas.

Jean-Marc Moschetta,
Head of Program

CAS

HAD1 - UAV Systems (HADA)

83 h, 5000 €, Jean-Marc Moschetta
4 short courses: HAD500, HAD501, HAD502, HAD503

Objectives: *Understanding Unmanned Aerial Systems from design to operations.*

CAS

HE1 - Helicopter Engineering 1 (HADA)

89 h, 6500 €, Jean-Marc Moschetta
3 short courses: THE1, THE2, THE3

Objectives: *Understanding helicopter flight dynamics, vibration and construction technics.*

CAS

HE2 - Helicopter Engineering 2 (HADA)

62 h, 4000 €, Jean-Marc Moschetta
2 short courses: THE4, THE5

Objectives: *Mastering helicopter embedded systems, flight tests and production quality.*

HAD500 Drones systems: design and mission (HADA)

25 h, 2300 €, January 2022

Course supervisor: Christophe Duverger, THALES

Key contents: *Introduction to Unmanned Aerial Systems. Concepts and use cases: military and civil operations, regulations; air vehicle classification and main vehicles description; systems architecture and certification; payloads description and interest; trends: market, roadmaps, programs, studies and future needs.*

HAD501 Payload and sensors for UAVs (HADA)

21 h, 2000 €, January 2022

Course supervisor: Nicolas Rivière, ONERA

Key contents: *Review of sensors and payloads for UAVs: EO/IR sensors, radars, laser range finders, LiDAR. Image processing. Introduction to navigation through vision, SLAM.*

HAD502 Drone safety and airworthiness (HADA)

15 h, 1800 €, January 2022

Course supervisor: Catherine Ronflé-Nadaud, DGAC

Key contents: *UAS (Unmanned Aircraft System) operations are risk-based while the access to the airspace is performance-based. This module presents how UAS airworthiness is managed depending on the operation and how the air risk could be mitigated with UAS traffic management.*

HAD503 Drone guidance and navigation (HADA)

21 h, 2000 €, January 2022

Course supervisor: Yves Brière, ISAE-SUPAERO

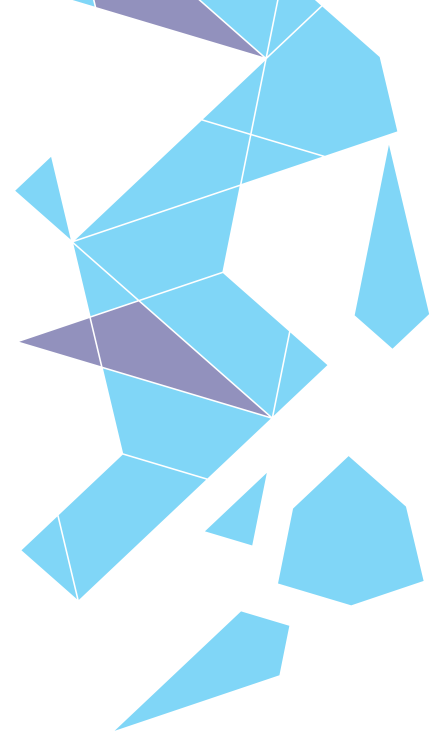
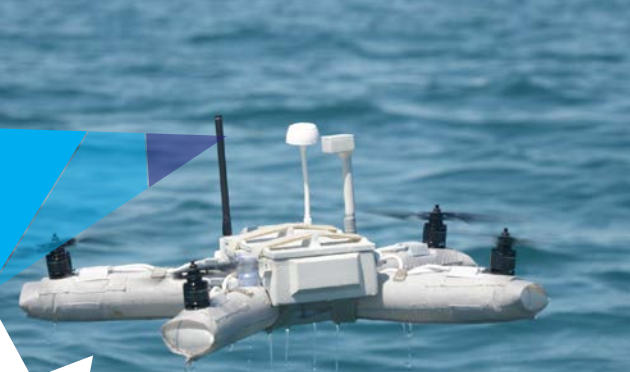
Key contents: *Architecture of embedded systems as applied to drones: autopilots, sensors, Inertial Measurement Unit (IMU), modems. Basic concepts of guidance and navigation for drones. Practical labwork sessions on quadrotors.*

HAD506 VTOL Drones (HADA)

31 h, 2300 €, March 2022

Course supervisor: Jean-Marc Quiot, AIRBUS HELICOPTERS Marignane

Key contents: *Introduction to VTOL Drones, autonomy levels, navigation in hostile environment, communication performance, ship-deck landing. Military and civil architectures, artificial-intelligence-based autonomous architecture.*





HE1 - Helicopter Engineering 1

THE1 Helicopter understanding (HADA)

27 h, 2300 €, February 2022

Course supervisor: Didier Casolaro, AIRBUS HELICOPTERS Marignane

Key contents: Rotor aerodynamics, helicopter flight qualities, helicopter performance, noise analysis and pre-design methods.

THE2 Helicopter dynamics (HADA)

31 h, 2300 €, February 2022

Course supervisor: Julien Guitton, AIRBUS HELICOPTERS Marignane

Key contents: Rotor dynamics, helicopter internal noise, structural dynamics and aero elasticity, fatigue and safety.

THE3 Helicopter materials and technology (HADA)

31 h, 2300 €, March 2022

Course supervisor: Alain Struzik, AIRBUS HELICOPTERS Marignane

Key contents: Helicopter production materials and technologies, composite materials, blade technology, rotor hub technology, gear boxes mechanisms, fatigue phenomenon, finite element methods as applied to helicopters.

THE4 Helicopter avionics systems (HADA)

31 h, 2300 €, March 2022

Course supervisor: Serge Germanetti, AIRBUS HELICOPTERS Marignane

Key contents: Radio communication, navigation and guidance. Helicopter Fly By Wire. Cockpit ergonomics, system integration, reliability and safety analysis. Man-machine interface.

THE5 Helicopter: Prototypes, tests, production, quality (HADA)

31 h, 2300 €, March 2022

Course supervisor: Nicolas Vidal, AIRBUS HELICOPTERS Marignane

Key contents: Helicopter flight test and integration. Value analysis and production methods. Aeronautical regulation and quality. Computer aided production management, helicopter maintenance.

HE2 - Helicopter Engineering 2



The Advanced Master Aeronautical Maintenance and Support - AMS - delivers the appropriate high-level competencies and know-how in aircraft architecture, maintenance and support delivered by experts. It allows an everyday exposure to the latest techniques and methods, regulations and standards applied through this value chain. The certificates and

short courses we offer will help attendees increase their skills to perform in the fast changing Maintenance & Support worldwide business.

The Advanced Master Aviation Safety: Aircraft Airworthiness - ASAA - aims at giving future managers a broad understanding of the issues and priorities in Airworthiness. We focus on providing skills that are essential to air transport safety and range from design to operations, within the international legal environment. Our courses cover both technical aspects of certification and legal and economic implications.

Joël Jezégou,
Head of Programs

CAS

AMS1 - Airworthiness & human factors for maintenance (AMS)

44 h, 4000 €, Joël Jézégou
2 short courses: AMS500, AMS600

Objectives: Understand continuing and continued airworthiness regulations, complemented by ETOPS operational approval and aircraft transfer. Understand safety aspects through human factors concepts and tools for a practical implementation of Safety Management System in MRO environment.

CAS

AEC1 Aircraft Engineering for Certification of Avionics & Systems (ASAA)

80 h, 5000 €, Joël Jézégou
2 short courses: AW9, AW10

Objectives: Acquire a comprehensive understanding of aircraft avionics, general systems and cabin, with due consideration given on technical skills for an airworthiness engineer and on relevant certification requirements.

CAS

AEC2 Aircraft Engineering for Certification of Flight and Structure (ASAA)

93 h, 6500 €, Joël Jézégou
2 short courses: AW7, AW8

Objectives: Acquire a comprehensive understanding of aircraft flight dynamics, structure and materials, with due consideration given on technical skills for an airworthiness engineer and on relevant certification requirements.





AMS103a Aircraft structure and materials for aircraft maintenance engineer (AMS)

46 h, 2900 €, October 2021

Course supervisor: Jean-Fred BEGUE, DGA

Key contents: *Flight and ground loads; fatigue and ageing aircraft (fatigue phenomena, endurance-initiation propagation, fracture mechanics, widespread fatigue damage, fatigue and damage tolerance for composite structures) airframe and engines materials (performances criteria, properties, applications); non-destructive tests (processes, techniques); introduction to additive layer manufacturing.*

AMS103b Structural repairs (AMS)

13 h, 1600 €, November 2021

Course supervisor: Pierre Gambier, AIRBUS

Key contents: *Structural repairs (damages, repair scenarios and criteria, methodologies, justification, approval, SRM).*

AMS107a Aviation regulation and airworthiness (AMS)

15 h, 1800 €, December 2021

Course supervisor: Joël Jézégou, ISAE-SUPAERO

Key contents: *Aviation safety objectives; international conventions and ICAO; European regulations and EASA; airworthiness regulation (initial type certification, certification of changes, continued airworthiness); overview of operations regulation.*

AMS107b Aircraft safety analysis (AMS)

20 h, 2000 €, December 2021

Course supervisor: Joël Jézégou, ISAE-SUPAERO

Key contents: *Safety of complex system principles; safety and reliability studies (FHA, PSSA, SSA); common cause analysis (PRA, ZSA, CMA).*

AMS301 Predictive maintenance and data analytics (AMS)

24 h, 2000 €, March 2022

Course supervisor: Fabrice Lebeau, Dassault Aviation

Key contents: Prognostics and health management (PHM) and predictive maintenance concepts; applications in aeronautics from aircraft data generation to development of added-value services; introduction to data science and machine learning techniques; usage of data analytics for maintenance purposes.

AMS500 Continuing and continued airworthiness (AMS)

24 h, 2000 €, February 2022

Course supervisor: Joël Jézégou, ISAE-SUPAERO

Key contents: EASA Part-21 Continued airworthiness process and in-service occurrence reporting EASA Continuing airworthiness regulations (Part-M, Part-145, Part-147, Part-66); ETOPS operations (approval, maintenance requirements and practices); aircraft transfer.

AMS600 Human factors and Safety Management System in Aeronautical Maintenance (AMS)

20 h, 2000 €, March 2022

Course supervisor: Claire Pélegrin, AIRBUS

Key contents: Human factors (individual and collective human performance and limitations, role of management); Safety Management System (SMS) concept, organization and responsibilities; risk management techniques in aeronautical maintenance environment (strategies, models: bowtie/ Reason/ PEAR, techniques: MEDA/MLOSA); safety culture promotion.



AEC1 Aircraft Engineering for Certification of Avionics Systems

AW4 Environmental certification (ASAA)

22 h, 2000 €, February 2022

Course supervisor: Joël Jézégou, ISAE-SUPAERO

Key contents: Aircraft engine emissions; aircraft noise; lightning phenomena and protection; icing and ice protection; electro-magnetic hazards (EMH).

AW6 Normal-category aircraft and unconventional products certification (ASAA)

21 h, 2000 €, March 2022

Course supervisor: Joël Jézégou, ISAE-SUPAERO

Key contents: Understanding of Regulation proportionality and CS-23; Technological innovation and certification; electrical and hybrid vehicles; UAVs; New air mobility challenges.

AW7 Flight (ASAA)

44 h, 2900 €, November 2021

Course supervisor: Jacques Verrière, pilote & flight safety expert

Key contents: Jet airplane principles of straight and steady level flight; high speed cruise performance; climb and acceleration performance; maneuvering performance; take-off and landing performance; handling qualities; stability and control; dynamic stability; certification requirements.

AW8 Structure (ASAA)

49 h, 2900 €, December 2021

Course supervisor: Laurent Michel, ISAE-SUPAERO

Key contents: Airplane airframe architecture; Materials performance criteria and properties; Flight and ground loads; Fatigue of aircraft structure; Ageing aircraft; Certification of composite structures; Applicable certification requirements and compliance demonstration.

AW9 Avionics (ASAA)

28 h, 2300 €, January 2022
Course supervisor: Lionel Bertin, AIRBUS

Key contents: Airplane avionics functions and systems: communication, navigation and surveillance, autoflight system, flight management system, electronic centralized aircraft monitoring; Integrated Modular Avionics (IMA) architecture and certification; connected aircraft and related certification challenges.

AW10 General Systems and cabin (ASAA)

52 h, 2900 €, January 2022
Course supervisor: Joël Jézégou, ISAE-SUPAERO

Key contents: Airplane general systems and cabin architecture, certification requirements: covering electrical systems, hydraulic systems, flight controls, landing gear, pneumatic systems and ice protection systems, fuel systems, oxygen systems, fire protection, cabin and cargo arrangement and safety.

AW11 Engine and powerplant (ASAA)

28 h, 2300 €, January 2022
Course supervisor: Xavier Carbonneau, ISAE-SUPAERO

Key contents: Engine thermodynamics; engine control, engine certification; turboshaft and turbopropeller; Auxiliary Power Units (APU); powerplant integration and certification.



Aeronautics



The Advanced Master Aeronautical & Space Structures - AES - prepares engineers with a future career in design, R&D,

or certification, in relationship with mechanical engineering applied to structures. Our Master program is a European reference in the field and we have identified 4 short courses that can be attended by professionals. You can thus increase your skills in numerical calculation for the most advanced structures, your knowledge in materials, as well as your understanding of their interferences with the environment (in particular loads and fluid-structure interactions).

Yves Gourinat,
Head of Program



SA410 Structural shells analysis & modeling (AES)

17 h, 1800 €, October 2021

Course supervisor: Yves Gourinat, ISAE-SUPAERO

Key contents: Calculation of symmetric membranes; Equations of discrete dynamics; Dynamics of solid continuous media; hybrid systems; Reissner's general shell theory.

SA411 Advanced numerical methods (AES)

11 h, 1600 €, October 2021

Course supervisor: Christine Espinosa, ISAE-SUPAERO

Key contents: Explicit FEM models: Explicit algorithms, Matrix variability, Material modelling, Rapid dynamics.

Particle techniques: SPH method, Fragmentation & fluid interaction.

SA402 Flexible structure dynamics: modeling & control (AES)

20 h, 2000 €, November 2021

Course supervisor: Daniel Alazard, ISAE-SUPAERO

Key contents: Modelling of flexible structures: Lagrange equations, notions of effective masses, Substructuring, modal analysis of flexible structures, collocation of actuators/sensors, model reduction.

Theory of linear servoing: transfer function/state representation, modal analysis, root location, frequency analysis, stability margins, gain/phase control of flexible modes.

SA409 Introduction to strategic management: an application to the aviation industry (AES)

15 h, 1800 €, February 2022

Course supervisor: Paul Chiambaretto, Montpellier Business School

Key contents: Specificities of civil aircraft construction; Situation of the Airbus-BOEING cluster; Civil aviation activity since 1952 (traffic, transport and fleet); Difficult technical compromises for the product definition; Industrial, commercial and financial management of an activity in global competition.



ISAE-SUPAERO has committed since 2011 in training AI professionals and notably data scientists who work in all economic

sectors. Beyond engineer degrees, ISAE-SUPAERO aims at helping professionals to develop their skills. We are particularly targeting executives who graduated before the «AI wave». We coordinate our training action in the ANITI (Artificial Intelligence Toulouse Institute) ecosystem. ANITI gathers industry actors and universities who share the aim of settling Toulouse as AI world leader. Our Artificial Intelligence & Business Transformation - AIBT - Advanced Master is part of the necessary transformation of data valuation, particularly by Artificial Intelligence. This program will help you acquire new skills, which are critical to help your business evolve. We offer part-time training for technical managers or high-potential managers.

Carlos Aguilar,
Head of Program

RNCP 35609 - Titre
"Manager de projet en Intelligence
Artificielle et Sciences des Données (MS)"



CAS

AIBT1 – Data integration and processing for value creation (AIBT)

84 h, 5000 €, Carlos Aguilar
3 short courses: AIBT101, AIBT102, AIBT103

Objectives: Understand key components of ETL-based data warehousing. Set up indicators on data quality and management. Implement the distribution of simple operations via the Map/Reduce principle in Spark. Connect on a cloud computing engine. Understand the usefulness of containers. Deploy a Docker container.

CAS

AIBT2 – AI oriented business model design (AIBT)

84 h, 5000 €, Carlos Aguilar
3 short courses: AIBT101, AIBT104, AIBT107

Objectives: Discover how modern AI has an impact on businesses. Know about the main legal aspects of data and learn about business models of "platforms". Understand the impact of Big Data and Deep Learning on innovation.

CAS

AIBT3 – Development & deployment of efficient AI technologies (AIBT)

84 h, 5000 €, Carlos Aguilar
3 short courses: AIBT105, AIBT106, AIBT108

Objectives: Explore the data analytics workflow. Discover a general overview of Machine Learning, Supervised and Unsupervised Learning. Know the main bottlenecks and challenges of data-driven approaches. Discover Reinforcement Learning and main concepts of modern Deep learning algorithms.

AIBT1

Data integration
and processing
for value creation

AIBT102 Data integration and exploration

28 h, 2300 €, October 2021

Course supervisor: Thomas Ladagnous, TRIMANE

Key contents: *Data Warehousing; History and recent evolutions; Architecture; Key functions; Layers.*

Data quality; Indicators; improvement.

Data visualization; visual perception; tools.

AIBT103 Big data processing

28 h, 2300 €, November 2021

Course supervisor: Guillaume Dupin, Continental

Key contents: *Distributed computing with Spark; MapReduce paradigm; Hadoop Stack; Hadoop Distributed File System.*

Virtualization and cloud computing; Economical models; Technical benefits; cloud engines. Docker.

AIBT2

AI oriented business
model design

AIBT101 Introduction to modern AI

28 h, 2300 €, October 2021

Course supervisor: Michaël Hoarau, CNRS

Key contents: *AI Basics; Machine Learning; Unsupervised and Reinforcement Learning. Fueling AI; Understanding the relationship between problem framing. Business outcomes and applicable algorithms. Business intelligence and business models.*

Major success stories of Business and AI.

AIBT104 The business of data

28 h, 2300 €, December 2021

Course supervisor: Samuel Fosso Wamba, TBS Education

Key contents: *AI in the world, geostrategic point of view through data and cloud. Legal environment (RGPD and beyond). New economy and the sharing economy. Open data.*

AIBT107 Data value creation

28 h, 2300 €, March 2022

Course supervisor: Samuel Fosso Wamba, TBS Education

Key contents: *AI and the marginal value of data, of algorithms. Changing the cost of prediction. Machine learning, market structure and competition; impact of productivity growth on employment. The impact of artificial intelligence on innovation.*

AIBT105 Optimization topics for AI

28 h, 2300 €, January 2022

Course supervisor: Xavier Olive, ONERA

Key contents: Artificial Intelligence, Machine Learning and Optimization. Gradient Descent Optimization.

Gradient based optimization methods; Convergence in Deep Learning.

Discrete optimization; Discrete satisfaction and optimization methods.

Metaheuristics; genetic algorithms; stochastic methods, CMA-ES, cross-entropy.

AIBT106 Machine learning and data analytics

28 h, 2300 €, February 2022

Course supervisor: Jonathan Sprauel, Thales Alenia Space

Key contents: The data analytics workflow; General overview of Machine Learning;

Unsupervised Learning. Ensemble methods; Anomaly detection; Bio-inspired ML,

Neural Networks and Deep Learning. Feature engineering and data preprocessing.

AIBT108 Sequential decision making in AI

28 h, 2300 €, April 2022

Course supervisor: Florent Teichteil-Koenigsbuch, Airbus

Key contents: Reinforcement Learning (RL); modern Deep RL algorithms. Scheduling;

optimization methods, modeling frameworks. Path Planning, path algorithms,

heuristic search, motion planning. Decentralized decision making; Multi-agent

concepts and game theory. Collaborative and adversarial decision making.

AIBT109 Change management

28 h, 2300 €, May 2022

Course supervisor: Samuel Fosso Wamba, TBS Education

Key contents: Change management; Organization and management of innovation.

Entrepreneurial ecosystem in AI in Montréal; Relocation of AI innovation from

big business to startups; Meetings with testimonials of entrepreneurs and major

companies.

AIBT110 AI certification, robustness and dependability

28 h, 2300 €, June 2022

Course supervisor: Grégory Flandin, IRT Saint Exupéry

Key contents: Learning algorithms and robustness, interpretability and explainability,

certificability. Norms in the aerospace and automotive industries; human/machine

couple in the decision process. Certification of systems based on AI; main legal

initiatives on the subject; major technology trends underlying norms on AI. Links

between usual engineering validation processes and their use on AI.

APM & MGPIE

Project Management



At ISAE-SUPAERO, we have been training leaders of the aerospace and defence industry since 1909.

This business requires its top managers to

master technical and managerial skills. Project management in aerospace environment requires mastering a wide scope of knowledge and know-how adapted to this challenging worldwide business.

To answer those needs, ISAE-SUPAERO offers 2 Advanced Master programs.

The Aerospace Project Management – APM - Advanced Master, jointly coordinated with Ecole de l'Air and ENAC, provides participants with cutting-edge knowledge and necessary competences to lead Project or Program teams in the global aerospace and defence industry.

ISAE-SUPAERO started in 2019 a new project management Advanced Master, which is fully taught in French: Management de Projets Innovants & Entrepreneuriat - MGPIE. This Advanced Master focuses on developing innovation skills, as well as entrepreneurial methods and tools. Those competencies are increasingly critical for our industry and we offer 1 certificate and 9 short courses to professionals, who are willing to boost their skills.

Philippe Girard,
Head of Programs

CAS

PMI1 - Preparation to PMI certification (APM)

60 h, 4000 €, Philippe Girard

Objectives:

Get trained by experts of PMBOK to prepare CAPM or PMP exams.

PM470 Project Management Fundamentals (APM)

30 h, 2300 €, October 2021

Course supervisor: Frédéric Minart, Indiana Conseil et Formation

Key contents:

Global approach for Project Management tools, technics and methods. Project management fundamentals. Two different parts: tools themselves, how to implement them and how to make them quickly operational. Roles and Responsibilities. Project scheduling. Cost and cash management, Risk management. How to motivate your team members. The communication process. Evaluate your own management style.

CAS

MP1 Idéation et innovation technologique (MGPIE)

60h, 4000 €, Philippe Girard

4 short courses: MP151, MP152, MP255, MP311

Objectives:

Connaître la méthodologie Design Thinking et utiliser les outils associés. Faire un prototype rapide. Maîtriser les bases de neurosciences et cognition pour comprendre les méthodes de créativité. Comprendre les tendances en matière d'Intelligence Collective pour mieux coacher ses équipes ; maîtriser les bases de la facilitation. Connaître l'approche Open Innovation. management, Risk management. How to motivate your team members. The communication process. Evaluate your own management style.

MP151 Design Thinking

9 h, 1600 €, October 2021

Course supervisor: Eva Villebrun, Océan Bleu

Key contents:

Connaître la méthodologie design thinking et utiliser les outils associés ; identifier le fonctionnement des utilisateurs en sachant les observer et les interviewer (entretien utilisateur) ; établir la cartographie du parcours utilisateurs (Customer Journey Map) ; faire un prototype rapide.

MP152 Créativité

21 h, 2000 €, October 2021

Course supervisor: Valérie Sanchis, Consultante innovation frugale

Key contents:

Connaître l'état actuel des connaissances en neuroscience et en cognition (bases pour comprendre les méthodes de créativité) ; Connaître les principales méthodes pour développer la créativité (CPS, ASIT) ; Animer une séance de créativité dans le cadre d'un projet innovant.

MP255 Intelligence collective

18 h, 1800 €, October 2021

Course supervisor: Anne-Hélène Labissy, Alter Human

Key contents:

Dynamiques collectives (créer le collectif et le cadre) ; Leadership collaboratif ; outils de l'intelligence collective (dont plateformes numériques) ; coaching d'équipe ; fondamentaux de la facilitation.

MP311 Open Innovation

9 h, October 2021

Course supervisor: Cyril Durand, Océan Bleu

Ce cours peut seulement être suivi dans le cadre du certificat MP1.

Key contents:

Approche open innovation ; management spécifique de l'open innovation ; types de partenariats ; liens avec la Propriété Intellectuelle ; philosophie open source des brevets, des logiciels.

 enseigné en français



MP201 Conduite et gestion de projet

30 h, 2300 €, November 2021

Course supervisor: Frédéric Minart, Indiana Conseil & Formation

Key contents:

Démarche générale de gestion de projet (concepts d'organisation et de gestion) ; pilotage des projets ; simulation du déroulement de projet avec prise en compte d'événements et d'aléas.

Le projet et son environnement ; gérer les facteurs humains dans un projet ; gestion des risques ; gérer l'après projet ; management opérationnel de la relation client, ou sous-traitant.

MP 253 Négociation

24 h, 2000 €, January 2022

Course supervisor: Vincent Frey, KEDGE BS

Key contents:

Appréhender les multiples stratégies utilisables en négociation ; identifier les besoins rationnels et irrationnels de l'interlocuteur ; construire une proposition répondant aux objectifs des deux parties ; défendre une position, en renforçant le climat de confiance au sein d'une équipe ; gérer l'incertitude, les tensions, la crise ouverte ; prévenir le conflit ; être fiable dans son comportement, créatif dans les propositions, les solutions envisageables et rigoureux dans l'application d'une stratégie préétablie.

MP303 Lean Startup

12 h, 1600 €, January 2022

Course supervisor: Youenn Cosotti, Back Market

Key contents:

Raccourcir le cycle de développement d'un nouveau produit/service ; approche « Customer Centric », « Minimum Viable Product », logique industrielle. Business model, matrice Osterwalder, prototypage de produit/service, utilisation d'outils de maquettage comme Mock up ou Wire frame ; identifier ambassadeurs, construire communauté de primo utilisateurs ; définir et suivre des Key Performance Indicators.

MP312 Méthodes Agile et scrum

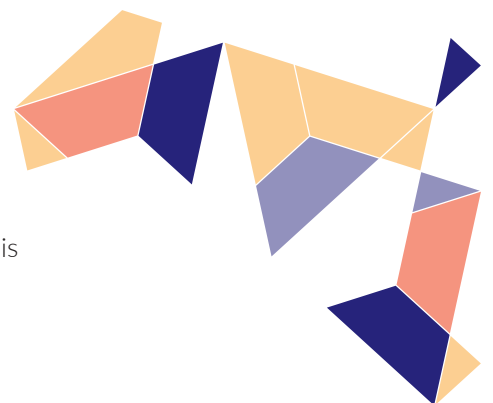
17 h, 1800 €, November 2021

Course supervisor: Géry Schneider, IBM

Key contents:

Placer les besoins du client au centre des priorités d'un projet ; améliorer la productivité de son équipe en rendant chacun apte à effectuer des tâches multiples. Aperçu de l'approche Agile (l'historique et les 4 valeurs de base). Présentation des 11 principes et des méthodes les plus répandues (Kanban, Scrum, etc.).

 enseigné en français



TAS Astro & SPAPS

Space



The TAS Astro - Space Systems Engineering - Advanced Master allows trainees to develop a high level of multidisciplinary

skills in space science, space systems engineering and space project management. Almost 1 in 5 students graduating at ISAE-SUPAERO then work in the space sector and we have a unique position in the ecosystem with space agencies, research agencies, or industrial companies in an international environment.

Stéphanie Lizy-Destrez,
Head of Program



We also offer a Space Applications & Services - SPAPS - Advanced Master, which gives participants a broad understanding of

space systems and their environment, constraints and capacities in the fields of earth observation, communications and navigation.

Raphaël Garcia,
Head of program

CAS

IS1 - Launchers (TAS ASTRO)

101 h, 6500 €, Stéphanie Lizy-Destrez
4 short courses: IS413, IS415, IS431, IS453

Objectives: Explain the main design processes for launchers. Master the concepts of basic astrodynamics related to the guidance of LEO, GEO and interplanetary space trajectories. Provide knowledge of the physics of the space environment encountered by the vehicle. Discover Control and Guidance algorithms and the principles of inertial navigation techniques.

CAS

APS1 - Earth Observation (SPAPS)

79 h, 5000 €, Raphaël Garcia
3 short courses: APS302, APS303, APS304

Objectives: Master the basics of image processing. Identify relevant analytics for end users. Develop the treatment chain needed to obtain the corresponding data. Have a broad view of the services that can be provided based on spatial imagery. Be able to identify the performances of space data analysis related to intelligence application requirements.

CAS

APS2 - Satellite Telecommunication Network (SPAPS)

51 h, 4000 €, Raphaël Garcia
2 short courses: APS401, APS402

Objectives: Understand the principles of IP network architectures. Be able to characterize the end-to-end quality of service and identify the distribution of objectives by segments. Be able to identify protocols and equipment needed for secured network architecture. Be able to describe network topology and define roles. Understand the impact of the satellite link on end-to-end quality of service. Understand satellite link major dimensioning parameters and adaptation to the radiofrequency channel. Be able to determine user quality of experience.



IS1 – Launchers

IS413 Space environment and effects (TAS ASTRO)

12 h, 1600 €, September 2021

Course supervisor: Stéphanie Lizy-Destrez, ISAE-SUPAERO

Key contents: Knowledge of the physics of the space environment encountered by the vehicle; constraints imposed by environment; training techniques for predicting effects on materials, electronics components and embedded systems. Various solutions to mitigate degradations and impact on the system involved.

IS415 Mission analysis and orbital mechanics (TAS ASTRO)

22 h, September 2021

Course supervisor: Stéphanie Lizy-Destrez, ISAE-SUPAERO

Key contents: Concepts of basic astrodynamics related to the evolution and the control of the LEO, GEO or interplanetary space trajectories.

IS431 Launchers architecture (TAS ASTRO)

49 h, October 2021

Course supervisor: Stéphanie Lizy-Destrez, ISAE-SUPAERO

Key contents: Main design processes for launchers. Different types of launchers, functions breakdown, links between functions and subsystems. Applications on staging and performances..

IS453 Launchers guidance and control (TAS ASTRO)

18 h, January 2022

Course supervisor: Stéphanie Lizy-Destrez, ISAE-SUPAERO

Key contents: Control and Guidance algorithms: principles, operational uses, exchange parameters. Principles and components of the inertial navigation techniques. Specification and design of the inertial measurement units (IMU). System trend for future launchers.

IS415, IS431, IS453 courses can only be attended within the certificate IS1



IS418 Space communications systems (TAS ASTRO)

21 h, 2000 €, January 2022

Course supervisor: José Radzik, ISAE-SUPAERO

Key contents:

Introduction to Satellite Communications Systems; Satellite communications systems architectures and components; Types of orbits, radio regulations.

Link Analysis; Digital communications; Satellite networking; Multibeam satellite systems.

Satellite communications payload; Performance objectives and functions; Repeater architecture; Antenna coverage concepts.

IS440 Space surveillance (TAS ASTRO)

20 h, 2000 €, January 2022

Course supervisor: Carlos Yanez, CNES

Key contents:

General overview on space debris (origin, sources, risks, evolution) including concepts about Space Surveillance and Tracking (SST). Different techniques used: Orbit Determination, Observation-to-Object association problem, Collision Risk Management, Time of Closest Approach(TCA), computation of the Probability of Collision(PoC) with a short-encounter method.

IS450a Space systems architecture (TAS ASTRO)

20 h, 2000 €, January 2022

Course supervisor: Stéphanie Lizy-Destrez, ISAE-SUPAERO

Key contents:

Mission analysis; Orbitography; Tracking error analysis.

Radio communications; Satellite emitter power; Station emitter power; Link budget calculation.

Thermal analysis; External flux analysis; Temperatures calculation.

Power subsystem; Solar panel sizing; Battery sizing; Global analysis.

Attitude control system; External torques analysis; Performance requirements;

Architecture definition; Actuators and sensors sizing.

IS552 Systems engineering of space systems (TAS ASTRO)

20 h, 2000 €, January 2022

Course supervisor: Frédéric Faye, Airbus DS

Key contents:

Juice spacecraft system design approach; Mission concept and astrometry measurement principle; Spacecraft design elaboration; Spacecraft design evolutions from advanced studies to frozen design; Spacecraft autonomy and failure management; Development model philosophy; Test facilities and environmental test campaigns; Functional verification; Performance verification; Juice project management.

Implementation of Juice within the ESA space science program; Industrial organization and team build up.



APS2 - Satellite Telecommunication Network

APS1 - Earth Observation

APS302 Image processing and data analysis (SPAPS)

30 h, November 2021

Course supervisor: Laurent Guillaume, Airbus DS

Key contents: Introduction to human and computer vision as a baseline for objects identification; principles of image processing; workshops and Python implementation; computer vision lab.

APS303 Applications and services, agriculture and forest (SPAPS)

27 h, January 2022

Course supervisor: Anne Jacquin, Airbus DS

Key contents: Vegetation maps from optical data; Agriculture analytics and Pixel Factory use; workshops using I4D and Overland tools; in the field application.

APS304 Applications and services, natural resources and intelligence (SPAPS)

22 h, February 2022

Course supervisor: Michaël Tonon, Airbus DS

Key contents: Intelligence and military applications; land surveillance; maritime domain surveillance; oil, gas and mining; water cycle.

APS401 Telecommunications and networks (SPAPS)

18 h, November 2021

Course supervisor: José Radzik, ISAE-SUPAERO

Key contents: Layered networks, protocols and services. Introduction to telecommunication networks, IP network architecture; IP routing, IPv4/IPv6 addresses management; Quality of Service (QoS) principles; Lab interactions between access techniques in satellite networks and upper protocol layers; encryption principles; introduction to radio network access technique.

APS402 Broadband satellite communication systems (SPAPS)

33 h, November 2021

Course supervisor: José Radzik, ISAE-SUPAERO

Key contents: Architecture of satellite communication systems, topologies and introduction to the link budget; propagation at high frequencies and Adaptive Coding and Modulation; link budget and radio resource management, multibeam coverage and frequency reuse; earth station and infrastructure; satellite Internet access network and Broadband Satellite Multimedia standards, DVB-S2 principles; Lab: continuous carrier operation for the return link; DVB-RCS2, MF-TDMA, DAMA radio resource management, random access and integration in IP networks; Lab: DVB-RCS2 return link, deterministic access; higher layer design, performance enhancement.

APS302, APS303, APS304 courses can only be attended within the certificate APS1
APS401, APS402 courses can only be attended within the certificate APS2



EUROSAE

ADVANCED TRAINING

SEN

Systems Engineering



SEN1 – Fundamentals of Systems Engineering

(in partnership with ALTRAN, operated by EUROSÆ)

98 h

Objectives: *Get basics about System thinking, System engineering management, Requirement engineering, MBSE (Model Based Systems Engineering), System architecture, System design.*



SEN2 - Preparation to INCOSE ASEP & CSEP certification

70 h, 5000 €, Rob Vingerhoeds

Objectives: *Become INCOSE ASEP or CSEP certified. Understand the definition and concepts of a system; know the concepts of System thinking and Life cycle overview; analyze technical processes ranging from requirements, to implementation, integration, verification and validation; understand how systems engineering contributes to business aspects.*

Other ISAE-SUPAERO inter, intra and custom-made professional courses with EUROSÆ

All ISAE-SUPAERO certificates and short courses that are introduced in the previous pages are parts of our Advanced Masters. ISAE-SUPAERO also disposes of a subsidiary company, named EUROSÆ, which business is fully dedicated to training professionals. EUROSÆ has been offering professional education since 1960. They are based in Paris and in Toulouse (inside ISAE-SUPAERO facilities). EUROSÆ gathers the advantages of agility and strong expertise thanks to their access to the ecosystems of experts. Lecturers come either from the academic world, or from the industrial world. They gather a network of 1600 experts and are able to help you define your need and find a custom-designed training solution. ISAE-SUPAERO and EUROSÆ work together on an everyday basis to build new pedagogical solutions and make the most of their assets and strengths, such as facilities and human resources.

We can work with industrial partners to create new programs such as the following executive certificate in Value Driven Systems Engineering, which stem from an ALTRAN need, is a spin-off of our SEN Advanced Master and is operated by EUROSÆ.

Short courses taught in French and operated by EUROSAE

Code stage	Titre stage
 AED 002	Systèmes propulsifs à propergols solides
 AED 003	Les facteurs humains dans l'aéronautique : concepts et mise en pratique sur simulateur et avion TB 20
 AED 004	Qualités de vol des avions modernes - Commandes de vol électriques
 AED 005	La conversion des aéronefs : L'approche industrielle du processus STC (#)
 AED 006	Mécanique spatiale et contrôle des véhicules spatiaux
 AED 007	Conception des lanceurs et véhicules de rentrée
 AED 008	Initiation à la mécanique du vol : des bases théoriques à l'application
 AED 008D	Introduction to flight mechanics
 AED 009	Systèmes propulsifs à propergols liquides
 AED 010	Conduite du vol
 AED 011	Conception de l'avion : techniques pour un avant-projet d'avion de transport commercial
 AED 012	Conception des satellites
 AED 013	Architecture des satellites
 AED 014	Segment sol de contrôle et opération des satellites
 AED 015	Architecture électrique avion : système électrique de la famille Airbus
 AED 017	Télémesures, télécommandes, localisation des satellites
 AED 019	Techniques des hélicoptères
 AED 020.1	Les techniques d'essais dans l'aéronautique
 AED 021.1	Initiation aux techniques d'essais en vol
 AED 022	Introduction aux systèmes spatiaux
 AED 023	Givrage en aéronautique
 AED 024	Le projet aéronautique : de la genèse à la réalisation
 AED 025	Le foudroiement des aéronefs
 AED 026	Systèmes d'air aéronautiques
 AED 027	Prise en compte du facteur "sécurité" dans la conception des avions
 AED 028	La sécurité feu dans les aéronefs
 AED 029	Initiation à la conception des avions
 AED 030	Les mini-drones : enjeux applicatifs et innovations technologiques
 AED 032	Introduction aux missiles tactiques
 AED 033	Conception des missiles tactiques
 AED 034	Introduction aux nano satellites
 AED 035	Guidage infrarouge des missiles tactiques
AED 036	Autodirecteurs électromagnétiques des missiles tactiques

Localisation



Toulouse



Paris

AED = Aéronautique, Espace, Défense

Contacts EUROSAE

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31400 Toulouse
Sylvie Perrin: 05 61 33 83 28
sylvie.perrin@eurosae.com

Code stage	Titre stage
AED 037.1	Maintenance des systèmes aéronautiques : aspects techniques et stratégiques
AED 038	Introduction à la maintenance programmée d'un avion de transport civil : processus MRB et Méthode MSG-3
AED 039	Moteurs d'hélicoptères : technologies et intégration à l'hélicoptère
AED 040	Les standards aéronautiques pour la certification des systèmes avioniques et ATM
AED 041	Géopositionnements statiques et dynamiques précis
AED 042	Les différences entre normes de maintien de navigabilité
AED 043	La navigation de l'avion - Situation actuelle et évolutions
AED 045	Les débris spatiaux et la surveillance de l'espace
AED 046	Qualités de vol des avions de transport modernes
AED 050.1	Certification des équipements aéronautiques : les processus réglementaires pour l'aviation commerciale
AED 050.2	Certification des équipements aéronautiques : les processus réglementaires pour l'aviation commerciale
AED 051.1	La navigabilité des aéronefs civils : de la conception à la maintenance
AED 051.2	La navigabilité des aéronefs civils : de la conception à la maintenance
AED 052	La navigabilité des aéronefs étatiques: de la conception à la maintenance
AED 053.1	La navigabilité des aéronefs civils et étatiques : de la conception à la maintenance
AED 053.2	La navigabilité des aéronefs civils et étatiques : de la conception à la maintenance
AED 054	PART 21J : Organismes de conception-Extension à la réglementation étatique (FRA 21J)
AED 055	PART 21G : Organismes de production - Extension à la réglementation étatique (FRA 21G)
AED 056	PART M : Maintien de la navigabilité - Extension à la réglementation étatique (FRA M)
AED 057	PART 145 : Organismes de maintenance : Extension à la réglementation étatique (FRA145)
AED 058	Assurance sécurité des logiciels dans le contrôle aérien ED-109, ED-109A et ED-153
AED 059	Introduction à l'observation de la Terre
AED 060	Evaluations "Safety" sur avion de transport - Aspects généraux pour les systèmes et "Software"
AED 061	Certification et suivi de navigabilité des moteurs
AED 062	Applications de la navigation par satellites : transports, géodésie, agriculture, environnement...
AED 063	Spécifications de certification (CS-25) vol et opérations
AED 064	Spécifications de certification (CS-25) structures
AED 065	Spécifications de certification (CS-25) powerplant
AED 066.1	Processus de certification (PART-21) et introduction aux spécifications de certification (C.S-25)
AED 066.2	Processus de certification (PART-21) et introduction aux spécifications de certification (C.S-25)

www.eurosae.com



Short courses taught in French and operated by EUROSAE

Code stage	Titre stage
 AED 067	Spécifications de certification (C,S-25) avionique
 AED 068	Spécifications de certification (C,S-25) cabine avion
 AED 069	Satellites haut débit : Marché et technologie
 AED 071	Découverte des drones. Les différents types de drones à voilure fixe et à voilure tournante
 AED 072	Découverte des hélicoptères. Principe du vol et différents types d'aéronefs à voilure tournante
 AED 073	Découverte de l'aviation d'affaires. Initiation au domaine et aperçu des classes d'avions
 AED 075	Découverte des circuits de bord. Circuits carburant, électrique, hydraulique, conditionnement d'air
 AED 076	Découverte des bases de la propulsion. Turbo-réacteurs, turbo-propulseurs et turbo-moteurs
 AED 102.1	Initiation aux techniques de l'aéronautique
 AED 102.2	Initiation aux techniques de l'aéronautique
 AED 131	Notions de systèmes embarqués en aéronautique civile et militaire
 AED 132	La maintenance prédictive en aéronautique
 AED 133	Les processus industriels et la gestion de configuration avion
 AED 134	Processus électrique: dossier de définition
 AED 135	A350 Réseau électrique ESN/MBN
 AED 136	Alternative à la navigation par satellites
 AED 137	Aéronefs plus électriques : De l'électrification à la propulsion
 ARF 001	Les asservissements linéaires
 ARF 002	Commande multivariable appliquée au pilotage automatique d'un avion civil en approche
 ARF 003	Commande "robuste" des systèmes
 ARF 025	Réseaux embarqués avioniques de nouvelle génération
 ELA 004	Communications sol-bord pour l'aviation civile
 ELA 005	Récepteurs de mesures et de contre-mesures en radar
 ELA 006A	Performances et applications du radar : des principes de base à l'avant projet
 ELA 006B	Performances et applications du radar : des principes de base à l'avant projet

Localisation



Toulouse



Paris

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Code stage	Titre stage
▲ ELA 013	Les systèmes radars aéroportés
⊗ ELA 023	Internet et multimédia par satellites : les normes DVB et leur application
⊗ ELA 024	Télécommunications spatiales
⊗ ELA 026	Radio logicielle
⊗ ELT 007	Effets de l'environnement spatial sur les composants électroniques embarqués
⊗ ELT 009	Initiation aux hyperfréquences
⊗ ELT 012	Initiation aux antennes
⊗ FMA 001	Méthodes Lattice-Boltzmann pour l'aérodynamique et l'aéro-acoustique
⊗ FMA 006	Initiation à l'aérodynamique
⊗ FMA 008	Conception aérodynamique de l'avion
⊗ FMA 013	Initiation aux écoulements visqueux et turbulents
⊗ FMA 015	Simulation et analyse des écoulements internes et externes
⊗ FMA 016	Aérodynamique et performances des machines tournantes
⊗ FMA 019a	Turbomachines aéronautiques : principes, fonctionnement, intégration, certification (1 ^{er} partie)
▲ GME 003	Corrosion aéronautique
⊗ GME 004.1	Fatigue des structures aéronautiques : phénomènes physiques, critères, règlement, fiabilité
▲ GME 004.2	Fatigue des structures aéronautiques : phénomènes physiques, critères, règlement, fiabilité
⊗ GME 005	Le calcul des structures par éléments finis dans un contexte industriel
⊗ GME 006	Dynamique des structures
⊗ GME 008	Bases de la mécanique des structures
⊗ GME 009	Initiation aux charges et structures des avions
⊗ GME 015	Calcul et fabrication de structures en matériaux composites
⊗ GME 023	Les technologies d'assemblage par collage structural
⊗ MTS 004	Machine Learning : une introduction
▲ SYS 005	Initiation au rôle de responsable d'essais dans le domaine de l'aérospatial

AED = Aéronautique, Espace, Défense
ARF = Automobile, Robotique, Informatique
ELA = Electronique, applications
ELT = Electronique, technologies
FMA = Mécanique des fluides, acoustique
GME = Génie mécanique, matériaux et structures
MTS = Mathématiques appliquées, traitement du signal
SYS = Systèmes, concepts, sûreté, sécurité





Executive education going digital at ISAE-SUPAERO

The pedagogical transformation of higher education with digital learning has been a major challenge for ISAE-SUPAERO, driven since 2018 by our IDEA team (Innovative Digital Education for Aerospace). We focus on education technologies R&D in order to produce digital contents.

ISAE-SUPAERO has been developing a micro-learning platform since 2018, to propose online modules related to aerospace engineering. These micro-modules are made of Aerospace Digital Nuggets (ADN). An ADN is short (maxi 30 min), reusable, interactive and multimedia.

ADN are key tools to customize all learning experiences. Online contents are helping our teaching staff to foster high added value exchanges with our students. ADN are used for our courses, in our MOOCs and SPOCs.

Another project, IREAL (Interactive Remote Experimentation for Aerospace Learning) is a unique digital platform for aerospace experimentation in the context of education. The experiments implemented are accessible anywhere and anytime, regardless of the number of learners.

Our mission is to create learning experiences and to help professionals master skills the aerospace industry needs. At ISAE-SUPAERO, we strive to help our industrial partners train their employees and have them upgrade their skills with a lifelong learning mindset.

Learn engineering with lab experiments

Innovative remote experimentation for aerospace Learning

ABOUT IREAL GIVE IT A TRY!

Lagrange, which is $Q\dot{J}$ minus kinetic operator $L\dot{J}$ applied to the kinetic

1:11 / 2:00

MOOC

DYNAMOOC
Understanding and Applying Dynamics

Understand the fundamentals of dynamics and learn how dynamics can be used in the creation of aerospace structures.

ISAE SUPAERO



ECATA:

the European Consortium for Advanced Training in Aerospace. Since 1992, ISAE-SUPAERO has been coordinating the Aerospace Business Integration executive education programme.

The ECATA ABI course gathers every year 20 delegates during 10 weeks off-the-job training, at ECATA universities, in different countries.

ECATA has developed a unique international training programme to help high-potential executives develop their skills in leadership and programme management.

For more information, visit ecata.org

Members of the consortium with ISAE-SUPAERO:

AIRBUS

BAE SYSTEMS

DASSAULT AVIATION



MTU Aero Engines

SAFRAN

LEONARDO



LIEBHERR Aerospace

TU Delft

TUM Technische Universität München



POLITECNICO DI TORINO



2021/2022

ISAE-SUPAERO EXECUTIVE EDUCATION



AERONAUTICS



DIGITAL



PROJECT
MANAGEMENT



SPACE



SYSTEMS
ENGINEERING



info.exed@isae-supaero.fr - 33 (0)5 61 33 80 37

How to register for short courses or for certificates of advanced studies:
go to ISAE-SUPAERO website, continuing education section.

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Thinkstock photos, Dassault Aviation, CNES/ESA/Arianespace, Getty Images.
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Document non contractuel - Juin 2021

