



Postgraduate Diploma Aircraft and Air Navigation Systems Engineering

» Modality: online

» Duration: 6 months

» Certificate: TECH Technological University

» Dedication: 16h/week

» Schedule: at your own pace

» Exams: online

Website: www.techtitute.com/in/engineering/postgraduate-diploma/postgraduate-diploma-aircraft-air-navigation-systems-engineering

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tech 06 | Introduction

From the identification of customer and operator needs, the design of the required systems to the final manufacturing process and authorization by the competent authorities, the aeronautical industry faces numerous challenges, where safety is of paramount importance. However, in recent decades it has taken on the new challenge of significantly reducing pollution, and new alternatives to traditional fuels have emerged.

A scenario in transformation that goes hand in hand with the evolution of Air Navigation Systems themselves, which have made it possible to improve the management of flight paths and large air traffic in a globalized world. In this sense, TECH has developed this Postgraduate Diploma that brings together the most advanced syllabus on aircraft engineering in 450 teaching hours.

A syllabus with a theoretical-practical approach aimed at providing students with advanced learning about aircraft propulsion plants, manufacturing start-up, their maintenance, as well as the decarbonization process being carried out by companies. All this, in addition, with numerous didactic material based on video summaries, detailed videos, diagrams, complementary readings and case studies.

In addition, students are offered a flexible program that allows them to keep up to date whenever and wherever they wish. All you need is a digital device (cell phone, tablet or computer) with an Internet connection, which will allow you to view the content at any time of the day. Thus, with no classroom attendance or scheduled classes, this teaching is an ideal academic option for those seeking professional progression, while making a quality university program compatible with their daily responsibilities.

This Postgraduate Diploma in Aircraft and Air Navigation Systems Engineering contains the most complete and up-to-date program on the market. The most important features include:

- Development of case studies presented by experts in Aeronautical engineering
- Graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where the self-assessment process can be carried out to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection



A 100% online Postgraduate
Diploma that adapts to your needs
and allows you to self-manage
your time to access the syllabus"



The multimedia pills will give a greater agility to this teaching that will deepen the generation of mathematical models of calculation of the various aircraft engines"

The program's teaching staff includes professionals from sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will provide the professionals with situated and contextual learning, i.e., a simulated environment that will provide an immersive education programmed to learn in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professionals must try to solve the different professional practice situations that are presented throughout the academic course. For this purpose, the students will be assisted by an innovative interactive video system created by renowned experts.

With the Relearning system you will achieve effective learning without the need to invest long hours of study and memorization.

Inquire about the most important advantages and disadvantages of each power plant at any time through this flexible academic option.







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General Objectives

- Provide the professionals with the specific and necessary knowledge to perform, with a critical and informed opinion, in any phase of planning, design, manufacture, construction or operation in the various companies of the aviation sector
- Identify the problems in aeronautical designs and projects in order to know how to propose effective, viable and sustainable overall solutions
- Acquire the fundamental knowledge of existing technologies and innovations under development in transport systems, in order to be able to conduct research, development and innovation studies in aeronautical companies and technology centers
- Analyze the main conditioning factors involved in the aeronautical activity and how to efficiently apply the latest techniques used in the aviation sector today
- Acquire a specialized approach and be able to monitor the management of any aeronautical department, as well as to execute the general management and the technical management of designs and projects
- Delve into the knowledge of the different critical aeronautical areas according to their different relevant actors, as well as achieve the knowledge, understanding and ability to apply the applicable aeronautical or non-aeronautical legislation and regulations





Specific Objectives

Module 1. Aircraft Propulsion Plants

- Fundamentals of the history of the development of aircraft engines
- Analyze the most important components of these propulsion plants
- Generate mathematical models for the calculation of the different engines
- Evaluate engine performance with these models and perform a comparative analysis
- Identify the most important problems and advantages of each powerplant
- Present the basis for the future evolution of these engines

Module 2. Aircraft Manufacturers and Maintenance

- Fundamentals of the industry concepts applied in these processes
- Establish a chronogram of events and decisions
- Substantiate the actions and decisions taken in each step of the production process
- Compile data of interest and particularities that occur throughout the process
- Identify the risks and uncertainties that arise in the different decision making processes
- Propose to the students the initiative to try to model alternative actions in order to evaluate possible outcomes
- Analyze whether there is room for substantial improvement in the phases presented

Module 3. Air Navigation Systems

- Analyze the evolution of different technologies in the field of navigation
- Specify the applicability of air traffic surveillance tools
- Justify the benefits of aviation navigation resources and procedures
- Determine the significant impact on safety and efficiency derived from the provision of ATS services
- Evaluate the benefits of airspace management through new models
- Compile management methods in systems maintenance
- Examine the significance of information sharing among aviation users
- Identify trends and impacts of new air navigation systems



Thanks to TECH you will be aware of the future challenges of air navigation systems"





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Management



D. Torrejón Plaza, Pablo

- Engineering Technician at ENAIRE
- Head of the Regulatory Unit of the National Airports Autonomous Organization
- Head of the Analysis Section of the National Airports Autonomous Organization Cabinet of the General Director
- Head of the Operations Section, Head of the Airport Security Office and Service Executive at Tenerife Sur Airport.
- Head of the Procedures and Organization Section in the Office of the General Director of Aena Airports
- Head of the Programming Department and in the Office of the President of Aena
- Head of the Institutional Coordination and Parliamentary Affairs Division
- Associate Professor and Collaborator in the Aeronautical Management Degree at the Universidad Autónoma de Madrid
- Head of the Regulatory Unit of the National Airports Autonomous Organization
- Head of the Analysis Section of the National Airports Autonomous Organization Cabinet of the General Director
- Head of the Operations Section, Head of the Airport Security Office and Service Executive at Tenerife Sur Airport.
- Master's Degree in Airport Systems from the Polytechnic University of Madrid
- Master in Organizational Management in Knowledge Economy from the Universitat Oberta de Catalunya (Open University of Catalonia)
- Master's Degree in Executive MBA from the Instituto de Empresa in Madrid
- Aerospace Engineer from the University of León
- Aeronautical Technical Engineer by Universidad Politécnica de Madrid
- Aeronautical Manager from the Autonomous University of Madrid
- Honorary decoration "Alférez Policía Nacional del Perú Mariano Santos Mateos gran General de la Policía Nacional del Perú" for exceptional services in aeronautical consultancy and training



Course Management | 15 tech

Professors

D. Morante Argibay, Antonio

- Airport Services Technician at Madrid Barajas Airport
- Responsible for operations and maintenance of telescopic fingers gangways at Madrid Barajas Airport
- Responsible for maintenance production of complex civil aircraft for air parcels: Aircraft: Boeing, Convair, Embarer, Cessna, Fairchild
- Responsible for maintenance of civil aircraft. Turbine, turboprop and propeller-driven internal combustion engines. Multi-turbine turbine and internal combustion engine helicopters. Aircraft: Cessna, Piper, Bell, Aeroespatiale (now Airbus), Robinson
- Responsible for maintenance and repair of aircraft interiors
- Continuing Airworthiness Officer (CAMO) for civil aircraft (airplanes and helicopters)
- Project commissioner for the acquisition and maintenance of combat helicopters for the Spanish Army (FAMET)
- Responsible for landing gear overhaul maintenance for Airbus civil aircraft. Trains: Airbus A320 (family) and Airbus A330 / A340 fleets
- Manufacturing Engineer for military air refueling and multi role aircraft
- Professor of the Master's Degree in Aviation Safety and Aircraft Maintenance at the Colegio de Ingenieros Técnicos Aeronáuticos de España (Association of Aeronautical Technical Engineers of Spain)
- Graduate in Aeronautical Technical Engineering from the Polytechnic University of Madrid
- Graduate in Aerospace Engineering from the Polytechnic University of León

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Dr. Arias Pérez, Juan Ramón

- Aeronautical engineering researcher
- Principal investigator of public and private projects such as Homogeneous Charge Compression Ignition for Aeronautical Engines (UPM), Development of advanced cooling systems for onboard electronics (Airbus EYY), GALOPE: Transversal Galoping effects to produce Electricity (Repsol) or Advanced Cooling Systems for onboard electronics (Indra)
- Associate Professor in the Fluid Mechanics and Aerospace Propulsion Department of the ETSI Aeronautics and Space
- Associate Professor in the Department of Motopropulsion and Thermofluidodynamics of the ETSI Aeronautics and Space
- PhD in Aeronautical Engineering from the Polytechnic University of Madrid
- Aeronautical Engineer from the Polytechnic University of Madrid

D. Fernández Domínguez, Manuel

- Technician in ENAIRE E.P.E. in the CNS/ATM Operational Safety Area
- Technician in ENAIRE E.P.E. in the CNS/ATM Operational Safety Area. ACC MADRID. Regional Directorate of Air Navigation Center-North
- Technician in the area of Short/Medium and Long-Range Fleet Maintenance and in the area of Aircraft Assistance for Iberia at Adolfo Suarez Madrid-Barajas Airport
- Technician in the Operations Area at Palma de Mallorca Airport and Josep Tarradellas Barcelona-El Prat Airport
- Lecturer in the Aeronautical Management Degree at the Autonomous University of Madrid
- AVSAF Instructor certified by AESA
- Degree in Tourism from the Autonomous University of Madrid
- Master's Degree in Aeronautical Management from the Autonomous University of Barcelona





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D. Leal Pérez Chao, Rafael

- Specialist in Air Navigation Service Providers
- Expert in Implementation of Cost and Management Control Systems projects, Project Management and ERP Systems Integration and coordination of Institutional Relations Areas
- Associate Professor at the Autonomous University of Madrid
- Participated in several teaching innovation projects in the last ten years,
 highlighting those of professional coaching, rubrics and academic support
- Degree in Economics and Business Administration from the Complutense University of Madrid
- Certificate of Pedagogical Aptitude from the Complutense University of Madrid
- Master's Degree in Financial Management from ESIC
- Superior Technician in Occupational Risk Prevention: specialties in Occupational Safety, Industrial Hygiene and Ergonomics and Applied Psychosociology



A unique specialization course that will enable you to acquire superior education for development in this field"





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Module 1. Aircraft Propulsion Plants

- 1.1. Principles of Aircraft Propulsion
 - 1.1.1. History of Aircraft Propulsion
 - 1.1.2. Conservation equations. Thrust definition
 - 1.1.3. Propulsive efficiency
- 1.2. Systems of Aircraft Propulsion
 - 1.2.1. Types of propulsion systems
 - 1.2.2. Comparative Analysis
 - 1.2.3. Applications
- 1.3. Propeller Propulsion
 - 1.3.1. Propeller actions
 - 1.3.2. Reciprocating Engine Architecture
 - 1.3.3. Turbocharging
- 1.4. Aeronautical Reciprocating Engines
 - 1.4.1. Engine Thermodynamic Analysis
 - 1.4.2. Power Control
 - 1.4.3. Performance
- 1.5. Basic Elements of Reaction Engines
 - 1.5.1. Turbomachines Compressor and Turbine
 - 1.5.2. Combustion chambers
 - 1.5.3. Air intakes and nozzles
 - 1.5.4. Thermodynamic Analysis of the Turboreactor
- 1.6. Turbojets
 - 1.6.1. Turboreactor operating model
 - 1.6.2. Performance
 - 1.6.3. Afterburners
- 1.7. Turbofan
 - 1.7.1. Why the evolution from turbojet to turbofan?
 - 1.7.2. Operating model of the turbofan
 - 1.7.3. Performance

- 1.8. Turboprop and turboshaft
 - 1.8.1. Architecture of turboprops and turboshafts
 - 1.8.2. Operating model of the turbofan
 - 1.8.3. Performance
- 1.9. Rocket Engines and other high speed plants
 - 1.9.1. Propulsion in Special Conditions
 - 1.9.2. The ideal rocket engine
 - 1.9.3. Ramjets and other applications
- 1.10. Environmental aspects of aircraft engines
 - 1.10.1. Aircraft engine pollution
 - 1.10.2. Use of Alternative Fuels
 - 1.10.3. Electric propulsion

Module 2. Aircraft Manufacturers and Maintenance

- 2.1. Market Analysis and Customer Conditions
 - 2.1.1. Request for Information (RFI)
 - 2.1.2. Manufacturer analysis
 - 2.1.3. Request for Purchase Order (RFP)
- 2.2. Design Organization
 - 2.2.1. Structure of a design organization. Legislation
 - 2.2.2. Design phases and certification specifications
 - 2.2.3. Systems Analysis
- 2.3. System Concurrency
 - 2.3.1. Motors and stand-alone power unit
 - 2.3.2. Landing gears
 - 2.3.3. Other on-board systems
- 2.4. Industrialization
 - 2.4.1. Structure of a production organization.. Legislation
 - 2.4.2. Phases of production
 - 2.4.2.1. Drawings and assembly instructions
 - 2.4.2.2. Installation and assembly on aircraft
 - 2.4.2.3. Functional tests on land
 - 2.4.2.4. Flight tests

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2.4.3.	Certification phase with the Authority
	2.4.3.1. Introduction of documentation and reviews
	2.4.3.2. Onshore testing
	2.4.3.3. Flight tests and certification flights
	2.4.3.4. Issuance of Aircraft Type Certificate (TC)
2.4.4.	Customer delivery phase and (ToT)
2.4.5.	Media design and subcontracting
Continuing Airworthiness and Operation	
2.5.1.	Continuous airworthiness
2.5.2.	Manuals and technical assistance services
2.5.3.	Operation
	2.5.3.1. In-flight operations
	2.5.3.2. Ground operations. Handling
Continuing Airworthiness Management Organization	
2.6.1.	Air Operators (AOC)
2.6.2.	Continuing Airworthiness Maintenance Organizations (CAMO)
	2.6.2.1. Structure and Legislation
	2.6.2.2. Responsibilities and Programs
2.6.3.	Maintenance contracts
Aircraft Maintenance Program	
2.7.1.	Documentary Bases
2.7.2.	Approval and updating of programs
2.7.3.	Compliance with specific air operation approvals
Aircraf	t Maintenance Organizations
2.8.1.	Structure and Legislation
2.8.2.	Technical capabilities and approvals
2.8.3.	Capabilities and designations
	2.8.3.1. Boroscopic Inspections
	2.8.3.2. Non-destructive testing of materials and structures
Critical	Tasks
2.9.1.	Scheduled maintenance
2.9.2.	Special approvals
2.9.3.	Unwanted Objects (FO) AND (FOD)

2.5.

2.6.

2.7.

2.8.

2.9.

- 2.10. Maintenance of Systems and Components2.10.1. Verification of equipment on bench
 - 2.10.2. Overhaul
 - 2.10.2.1. Engine hot sections
 - 2.10.2.2. Spectrometry of oils
 - 2.10.2.3. Fuel contamination analysis
 - 2.10.3. Civilian and military fleets. Differentiated maintenance

Module 3. Air Navigation Systems

- 3.1. Air Navigation Systems
 - 3.1.1. Air Navigation. Key Concepts
 - 3.1.2. CNS/ATM system. Key Concepts
 - 3.1.3. Air Navigation Services
- 3.2. Aeronautical Communications Systems: From the sea to the air
 - 3.2.1. Communications systems and services
 - 3.2.2. Aeronautical Fixed Service
 - 3.2.3. Aeronautical Mobile Service
 - 3.2.4. Future of Aeronautical Communications
- 3.3. Navigation Systems: Precision
 - 3.3.1. Autonomous Systems
 - 3.3.2. Non-Autonomous Systems
 - 3.3.3. Augmentation Systems
- 3.4. Surveillance Systems. Traffic Monitoring Tools
 - 3.4.1. Surveillance functions and systems
 - 3.4.2. Contribution of radar to the development of aviation
 - 3.4.3. Dependent surveillance (ADS): Justification and application
 - 3.4.4. Multilateration: Advantages and applications
- 3.5. Extension of flight paths through Area Navigation
 - 3.5.1. The PBN concept
 - 3.5.2. RNAV/RNP Relationship
 - 3.5.3. Advantages of the PBN concept

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- 3.6. AFTM Management
 - 3.6.1. Principles of AFTM in Europe
 - 3.6.2. Traffic flow management: need for centralization and objectives
 - 3.6.3. ATFCM-CFMU Systems and their phases
- 3.7. ASM Service Airspace Management
 - 3.7.1. ASM Service: the FUA (airspace flexibility) concept
 - 3.7.2. Levels of airspace management and structure
 - 3.7.3. Airspace management tools
- 3.8. ATS services: Air traffic safety and efficiency
 - 3.8.1. Background of air traffic control
 - 3.8.2. Air traffic control service
 - 3.8.3. FIS/AFIS Information Service
 - 3.8.4. Flight Progression Tab: From token bay to OSF
- 3.9. Other ATS services: MET and AIS
 - 3.9.1. The meteorological service: Products and their distribution
 - 3.9.2. AIS Service
 - 3.9.3. ATS service messages: Formats and transmission
- 3.10. Current and Future Situation. Impact of the New CNS/ATM Systems
 - 3.10.1. New CNS systems
 - 3.10.2. Benefits and implementation
 - 3.10.3. Foreseeable direction of the Air Navigation Systems







Delves into the use of alternative fuels in the aeronautical sector through a flexible and dynamic university program"





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Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.



At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"



You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.

Methodology | 27 tech



The student will learn to solve complex situations in real business environments through collaborative activities and real cases.

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.



Our program prepares you to face new challenges in uncertain environments and achieve success in your career"

The case method is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

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Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

In 2019, we obtained the best learning results of all online universities in the world.

At TECH, you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



Methodology | 29 tech

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

This program offers the best educational material, prepared with professionals in mind:



Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.



Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

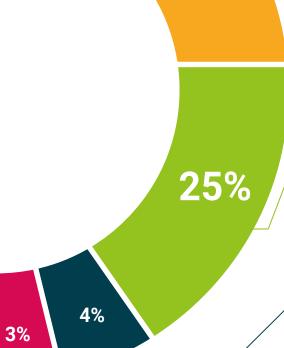


This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.





20%





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This **Postgraduate Diploma in Aircraft and Air Navigation Systems Engineering** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma** issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: Postgraduate Diploma in Aircraft and Air Navigation Systems Engineering Official N° of Hours: 450 h.



technological university Postgraduate Diploma

Aircraft and Air Navigation Systems Engineering

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

