Advanced Master's Degree
Drone Design and Piloting

tech global university

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Advanced Master's Degree
Drone Design and Piloting

- Modality: **online**
- Duration: **2 years**
- Certificate: **TECH Global University**
- Credits: **120 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/engineering/advanced-master-degree/advanced-master-degree-drone-design-piloting**

Index

01

Introduction

The world of aeronautics has changed with the emergence of drones. Drone technology is advancing at great speed, evolving much faster than even mobile technology. Therefore, it is essential for professionals to anticipate and train in a specialty that, in the near future, will be the most sought-after among professionals in this new discipline. This program brings students closer to the field of Engineering and Drone Piloting, with an up-to-date and high quality specialization. It is a complete program that seeks to train students for success in their profession.

Drone flying is on the rise, and acquiring the skills to become a pilot in this sector is a highly useful competency to gain in an ever-growing industry"

The drone market is helping government agencies and academies to reinvent the aeronautical world. The advancement of drones implies a growing need for designers and pilots to acquire specialist knowledge and skills in the field. It is not the same to fly an amateur drone as it is to fly a high-value drone for specialized operations. That is why this intensive specialization is so necessary, as it will facilitate the training of professionals who are specialists in drones.

With this in mind, the professionals at TECH have designed this very complete Advanced Master's Degree that aims to train students in the Design and Piloting of Drones so that they acquire complete and transversal skills to work optimally in this sector. Thus, this educational program will cover the contents and techniques of unmanned aircraft flight in different professional scenarios across the world, as well as the technical aspects involved in their design and assembly.

Likewise, during the specialization, professionals will learn both operational and safety aspects. In this regard, the student will learn more about the institution that holds aeronautical authority: The Aviation Safety Agency. In this regard, we will delve into the ways to facilitate compliance with the regulations in force, through acceptable means of compliance. In the same legal section, the specific regulations of different Latin American countries such as Chile, Colombia and Mexico will also be addressed.

In the same way, throughout the specialist course, there will be a study and analysis of meteorology, which provides specific knowledge for safe flights: An essential part of aeronautics. In this sense, the student will have the opportunity to learn how AEMET works. This is the State Meteorological Agency that provides pilots with aeronautical information in the form of forecasts that serve to ensure the viability of the flight. In this regard, two specific documents will be analyzed: The Guide to Meteorological Services for Air Navigation and the Aeronautical Meteorological Information Guide.

This **Advanced Master's Degree in Drone Design and Piloting** contains the most complete and up-to-date educational program on the market. The most important features include:

- The latest technology in e-learning software
- A highly visual teaching system supported by graphic and schematic contents that are easy to assimilate and understand
- The development of practical case studies presented by practising experts
- State-of-the-art interactive video systems
- Teaching supported by telepractice
- Continuous updating and retraining systems
- Self-regulated learning: fully compatibility with other occupations
- Practical exercises for self-assessment and learning verification
- Support groups and educational synergies: Questions to the expert, discussion forums and knowledge
- Communication with the teacher and individual reflection work
- Content that is accessible from any fixed or portable device with an Internet connection
- The supporting documentation data banks are permanently available, even after the program

If you are looking for a quality specialization that will help you to specialize in one of fields with most professional opportunities, then this is your best option"

Apply the latest advances in Drone Flights in your daily practice and give your resume a boost in value"

A training program created for professionals who aspire to excellence that will allow you to acquire new skills and strategies in a smooth and effective way.

Our teaching staff is made up of working professionals. In this way, we ensure that we provide you with the up-to-date training we are aiming for. A multidisciplinary staff of trained and experienced professionals from a variety of environments, who will develop theoretical knowledge in an efficient manner, but above all, will put at the service of specialization the practical knowledge derived from their own experience.

The efficiency of the methodological design of this Advanced Master's Degree enhances the student's understanding of the content. Developed by a multidisciplinary team of e-learning experts, it integrates the latest advances in educational technology. In this way, the student will be able to study with a range of comfortable and versatile multimedia tools that will give them the operability they need in their training.

The design of this program is based on Problem-Based Learning, an approach that conceives learning as a highly practical process. To achieve this remotely, we will use telepractice. With the help of an innovative interactive video system, and Learning from an Expert, you will be able to acquire the knowledge as if you were actually dealing with the scenario you are learning about. A concept that will allow students to integrate and memorize what they have learnt in a more realistic and permanent way.

A deep and comprehensive look at the most up-to-date strategies and approaches in Drone Design and Piloting.

02

Objectives

Our objective is to train highly qualified professionals for the working world. An objective that is complemented in a global manner, by promoting human development that lays the foundations for a better society. This objective is focused on helping professionals reach a much higher level of expertise and control and it is goal that you will be able to achieve thanks to a highly intensive and detailed course.

If your goal is to improve in your profession and acquire a qualification that will enable you to compete among the very best, then look no further: Welcome to TECH"

General objectives

- Create a specific and concrete vision of unmanned aviation in the world and, more specifically, in Europe and the United States
- Delimit the actions of the different types of pilots: professional and sport pilots
- Characterize unmanned aerial platforms from a pragmatic point of view
- Apply inspection, checking, adjustment and replacement procedures on assembling, elements, parts and indication systems to perform scheduled and corrective maintenance on them, both on the unmanned aerial platform and on the necessary accessory elements, such as the ground station or accessories such as payload
- Select the procedures established in the maintenance manuals to perform the storage of elements, parts and systems, including energy sources
- Apply the procedures established in the maintenance manuals to perform aircraft weighing and payload calculation operations
- Analyze the management and organization models used in aeronautical maintenance in order to carry out related actions
- Apply warehouse management techniques to perform stock control
- Perform the procedures established by the company in order to carry out operations in the manufacturing and assembly processes
- Evaluate situations of occupational risk prevention and environmental protection. Propose and apply prevention and protection measures, both personal and collective, according to the applicable regulations in the work processes, in order to guarantee safe environments
- Identify and propose the necessary professional response to universal accessibility and "design for everyone"
- Identify and apply quality parameters at work and in the activities carried out throughout the learning process, in order to assess the culture of evaluation and quality, and to be able to monitor and improve quality management procedures
- Specify the role and responsibilities of an aeronautical operator. Specify the inner workings of this "small aircraft company" and its management operations vis-à-vis the Aviation Authority
- Use procedures related to the entrepreneurial, business and professional initiative culture, in order to carry out the basic management of a small company or undertake a job
- Carry out safe professional flights in the different scenarios, following the normal and emergency procedures established in the Operations Manual
- Carry out the test flights necessary for the development of air operations following the manufacturer's maintenance manual indications and the legislation in force
- Identify the work procedures involved in each intervention, both flight and maintenance, in order to select the required technical documentation

Specific objectives

Module 1. Particularities of Drones

- Acquire a clear vision of the specificities and characteristics of the legislation around the world, and more specifically in Europe and the USA
- Present the different uses of drones: in training, as a model aircraft, and as a sport
- Structure, organize and define the different institutions that, in a regulated way, act in the non-professional drone environment
- Implement and taxonomize the different professional uses of drones in functional operations through engineering: from cartography, to agriculture, photogrammetry, civil engineering, thermography, environment, mining, various inspections, photography, advertising and emergencies

Module 2. Occupational Risk Prevention With Drones

- Identify the specific regulatory framework
- Gain in-depth knowledge of the hygiene and ergonomy of the job
- Adapt personal equipment to the specific needs of each use
- Gain in-depth knowledge of the procedures to be followed in the event of an accident
- Identify the possible risks related to outdoor work with drones and present the preventive measures

Module 3. R&D&I: Aircraft Performance

- Recognize the importance of the capabilities of unmanned aerial platforms for the development of aerial activity
- Develop basic skills and aptitudes in the knowledge of the features of RPAS
- Recognize the necessary features of an unmanned aircraft to perform safe flights in different scenarios
- Identify the necessary features of an unmanned aircraft to perform safe flights with different configurations and other influential factors
- Specify the forces and energies acting on an aircraft in the different phases of flight

Module 4. Design and Engineering I: Specific Knowledge of Drones

- Based on the laws of physics, gain in-depth knowledge of the basic principles of flight, specifically aerodynamics
- Develop skills and aptitudes in the knowledge of the basic components of an unmanned aircraft, its operation and possibilities
- Acquire the elements that make up an unmanned aircraft and the requirements of this equipment
- Gain in-depth knowledge of the importance of maintenance, as well as its obligatory nature and its limitations

Module 5. Design and Engineering II: Advanced Maintenance of Drones

- Ensure that each intervention is oriented towards the safety of the flights
- Raise awareness of the importance and obligation to carry out aircraft maintenance according to the operator's instructions
- Raise awareness of the importance and obligation to carry out aircraft maintenance according to the manufacturer's instructions
- Gain in-depth understanding of the most important items of aircraft maintenance in order to observe and act in each situation
- Acquire the necessary knowledge to act in the maintenance of unmanned aerial platforms depending on each MTOM
- Act in accordance with good practices and with respect for the environment

Module 6. Thermography with Drones I

- Gain access the fundamental knowledge of thermography
- Apply and integrate drones in heat technology
- Select the camera in function with its usefulness and versatility
- Adapt the functionality of the infra-red camera to the proposed mission
- Process and analyze images until finding the end result
- Apply the acquired knowledge to different aeronautical jobs
- Visualize, edit and analyze the infra-red images taken with the proposed software
- Identify the most common errors in order to mitigate them in the final product to be delivered the customer

Module 7. Thermography with Drones II

- Develop thermal imaging analysis as a foundation for various applications
- Deepen understanding of the identification of the capabilities of thermal technology and their implementation in practice
- Develop field work methodologies to generate effective diagnostics
- Enhance the personal skills of the image analyst based on scientific analysis
- Develop skills for an informed diagnosis
- Specify and infer situations on the basis of facts gathered
- Apply infrared technology to develop procedures for resolving actions of immediate and future application
- Solve application needs that cannot be met by other technologies
- Issue justified thermographic reports as a basis for improvement actions

Module 8. Geographic Information Technology for Drones
- Implement the technology for collecting spatial data
- Manage spatial data, its sources and resources
- Develop coordinate systems and data formats
- Specify geographic information systems using drones
- Design specific missions to be applied in spatial planning and land-use management

Module 9. Aerial Surveys and Photogrammetry with Drones
- Know the fundamental principles of photogrammetry
- Gain specific knowledge of the fundamentals and operations of photogrammetry with drones
- Define the different flight options and camera to carry out the mission
- Analyze, in a practical way, exogenous conditions
- Identify and interpret the software options proposed for our particular work
- Prepare a final result as a deliverable product

Module 10. Operations Manual
- Gain in-depth knowledge of the inner workings of an unmanned aircraft
- Gain in-depth knowledge of a drone operator's relations with the competent authority
- Formalize operational procedures in the form of planning, organization, direction, coordination and control of the established requirements
- Recognize aspects for continuous improvement in training
- Develop and implement the necessary constraints
- Identify and evaluate possible risks
- Specify methodologies for the adequate maintenance of the Unmanned Aviation System (UAS)
- Gain in-depth knowledge of the safe conduct of aviation operations
- Develop the capabilities, skills and competencies to implement the configuration of an operator under security standards

Module 11. Navigation and Interpretation of Maps
- Interpret the different projections of the earth for application to the different aircraft positions
- Navigate the aircraft safely by hand, knowing the position of the aircraft at all times
- Navigate the aircraft automatically and safely, knowing its position at all times and being able to intervene in any phase of the flight
- Gain in-depth knowledge of the different navigation aids, their sources and applications
- Implement navigation aids
- Develop the ability to take into account the limitations that each legislation publishes, in order to carry out flights in safe conditions

Module 12. Meteorology
- Develop the capabilities, skills and aptitude in this discipline
- Be able to differentiate the quality of the sources when gathering aeronautical meteorology information
- Interpret the different meteorological products for their application in the flights to be performed
- Apply the knowledge acquired in each phase of the flight
- Prevent possible adversities to which the flight may be subjected

Module 13. Human Factors for Remotely Piloted Aircraft

- Acquire an integrated vision of aviation psychology and medicine
- Gain in-depth knowledge of the situational causes and consequences related to the remote pilot profession
- Adapt to new work situations generated as a result of the means and aeronautical techniques used, labor relations and other aspects related to the specialization
- Maintain fluid relations with the members of the functional group in which they are integrated, taking responsibility for the achievement of the objectives assigned to the group, respecting the work of others, organizing and directing collective tasks and cooperating in overcoming the difficulties that arise
- Solve problems and make decisions within the scope of their subordinates' and their own achievements, within the framework of established rules and plans

Module 14. Operational Procedures

- Establish procedures as a fundamental basis for flight and air operations
- Develop a critical capacity and prioritize flight safety and the review of procedures in accordance with the company's internal legal formalities and external aviation regulations
- Acquire a general vision of the operations manual and make it a particular procedure guide. Observe it and communicate any possible improvements through the regulatory channel
- Identify and respect the different operational scenarios in which we are going to carry out our aerial activity
- Understand the responsibility of being flight personnel: both pilot and observer
- Understand how to become an operator
- Be sensitized to record flight times and aircraft maintenance
- Inform the pilot of the maintenance of their competence as a pilot
- Specialize in operating procedures and qualifications

Module 15. Communications

- Define and know the characteristics of waves and their transmission
- Identify the bands of frequency and know their main characteristics. Aeronautical bands of frequency
- Identify and know the types of wave: radio waves, ground waves, sky waves
- Know and identify the main components in a radio transmission and the elements that make up a transmission
- Identify the different categories of the messages
- Use the phonetic alphabet, transmission of letters and numbers, decimal numbers, identifiers
- Use the structure and components of the standard communications: Structure a communication, order the messages and listen
- Correctly apply the transmission techniques, microphone techniques, message transmission, message collation
- Describe and use standard phraseology. Messages and use in air traffic and general air travel
- Gain in-depth knowledge of the different types of aerodromes and the types of transmission used in each of them: controlled and uncontrolled aerodromes
- Understand and implement distress procedures, description and practice of procedures, condition of danger, content of distress messages, radio silence of competent authority
- Prioritize and implement emergency procedures

Module 16. Dangerous Goods and Aviation

- Develop a critical capacity in accordance with the legal procedures for the application of legislation
- Establish the appropriate procedures for this type of goods, as a fundamental basis for the specialized transportation requirements
- Identify possible anomalies, intentional or unintentional, and take action to protect the integrity of people and property
- Provide technological procedures in order to optimize the processes necessary for the transport of dangerous goods

Module 17. Engineering Technology in Flight

- Acquire an overview of the design of a drone based on a concrete example
- Acquire sufficient skills to perform safe flights, integrating all phases of flight and demonstrating the relevance of design and technology
- Acknowledge the importance of adequate flight preparation to ensure a safe flight
- Acquire responsible habits regarding the basic and mandatory maintenance of aerial platforms
- Register the flights in the corresponding books

Module 18. Integration of Drones for Industry and Practical Uses

- Applying specific procedures to aerial filming
- Design and organize, in order to put into practice, the most concrete modes of action in order to obtain the desired end product: Images in the air and on the ground, both indoors and outdoors
- Perform a variety of tasks applied to technical and scientific work: filming, risk assessment, inspections, surveillance and security, and search and rescue using advanced engineering techniques
- Manage the images generated in the various scenarios in a complete and specific way
- Prepare formats for different purposes: conversion, delivery to the final customer, PR

Our goal is to help you achieve yours, through a very unique specialization program that will become an unparalleled experience which will enable professional growth”

03

Skills

Once all the contents have been studied and the objectives of the Advanced Master's Degree in Drone Design and Piloting have been achieved, professionals will have gained a superior level of performance and expertise in this area. An exhaustive approach in a high-level specialist program which will really make the difference.

Achieving excellence in any profession requires effort and perseverance. But, above all, the support of professionals, who will give you the boost you need, with the necessary means and assistance. At TECH, we offer you everything you need"

General skills

- Develop drone engineering and operations applications
- Master the global environment of drone flights, from the international context and markets, to project development, operation and maintenance plans and sectors such as insurance and asset management
- Apply acquired knowledge and problem-solving skills in current or unfamiliar environments within broader contexts related to drone flights
- Be able to integrate knowledge and gain a deeper vision of the different uses of drone, as well as the importance of their use in today's world
- Know how to communicate design, development and management concepts of the different drone flight systems
- Understand and internalize the scope of digital and industrial transformation applied to drone flight systems for efficiency and competitiveness in today's market
- Be able to critically analyze, evaluate and synthesize new and complex ideas related to the field of drone flights
- Be able to promote, in professional contexts, technological, social or cultural progress within a knowledge-based society

Specific skills

- Obtain the qualification to perform maintenance on remotely piloted aircraft
- Respond to engineering needs with practical applications in aerial operations with drones
- Select the required technical documentation according to the intervention to be carried out, complying with specific aeronautical regulations
- Perform scheduled and corrective maintenance on the electric motor, ground station, chassis, landing gear systems, power supply systems, controller, drives and propellers, while complying with specific aeronautical regulations
- Perform scheduled and corrective maintenance of the platform's hydraulic power, energy and pneumatic systems, complying with specific aeronautical regulations
- Store and conserve the elements that make up the aircraft, complying with specific aeronautical regulations
- Perform aircraft weighing operations
- Perform stock control for the management of spare parts in the warehouse
- Perform operations in the manufacturing and assembly processes of elements and components of the engines, structures and aircraft systems
- Perform inspection and quality control activities in the manufacturing and assembly of engines, structures, aircraft systems and their components, as well as in their maintenance operations, complying with specific aeronautical regulations
- Perform safe flights being familiar with normal and emergency aeronautical procedures, applying and respecting the legislation in force
- Implement aeronautical communication in the environment, complying with the specific regulations of the aeronautical authority
- Manage the flight trajectory safely, both automatically and manually, in compliance with the regulatory framework
- Analyze the different situations in the different possible scenarios on order to make safe decisions
- Manage workloads effectively
- Adapt to the constant regulatory and technological changes, complying with specific aeronautical regulations
- Possess a high capacity for constant learning
- Perform actions related to the organization and management of mandatory basic maintenance

04

Course Management

In order to provide an Advanced Master's Degree of the highest quality, we are proud to work with a teaching staff of the highest level, chosen for their proven track record in the field of education. Professionals from different areas and fields of expertise that make up a complete, multidisciplinary team. A unique opportunity to learn from the best.

Our professors bring their vast experience and their teaching skills to offer you a stimulating and creative training program"

Management

Mr. Bazán González, Gerardo

- Electronic Engineer
- Specialist in Aviation Works in Spain and Latin America
- Key Account and Institutional Expert
- RPAS Pilot

Mr. Pliego Gallardo, Ángel Alberto

- Airline Transport Pilot (ATPL)
- RPAS, Ultralight Aircraft and Private Plane Pilot
- Instructor and Theoretical and Practical Examiner for RPAS
- University Professor in at UNEATLANTICO
- University Diploma from the Secretary of State for Universities and Research
- Professor of "Aircraft Maintenance" European Social Fund Course (TMVVO004PO) FEMPA Business School 2019
- Degree in Primary Education Teaching from the University of Alicante
- Pedagogical Aptitude Course from the University of Alicante
- Authorised Operator for AESA (State Aviation Safety Agency)
- Manufacturer of RPAS authorized by AESA

Mr. Saiz Moro, Víctor

- Industrial Technical Engineer
- RPAS Pilot
- Theoretical and Practical Instructor for RPAS
- Authorised Operator for AESA (State Aviation Safety Agency)
- Manufacturer of RPAS authorized by AESA
- Specialist and Expert in Aeronautical Consulting

Professors

Mr. Buades Blasco, Jerónimo

- Geographer
- Specialist in Information Systems and the Environment
- Pedagogical Aptitude Course from the University of Alicante
- RPAS Pilot

Mr. Fernández Moure, Rafael

- Specialist in Airport Security
- Expert in Airport Security
- RPAS Pilot RPAS Instructor

Ms. López Amedo, Ana Maria

- Vice president of the Federation for Air Sports in the Community of Valencia
- President of the San Vicente del Raspeig Air Sports Club
- Institutional Expert
- Specialist and Expert in Unmanned Aviation
- RPAS Pilot
- RPAS Instructor
- RPAS Examiner

05

Structure and Content

The contents of this Advanced Master's Degree have been developed by the different experts on this course, with the clear purpose: of ensuring that our students acquire each and every one of the necessary skills to become true experts in this field. The content of this course will enable you to learn all aspects of the different disciplines involved in this field. A complete and well-structured program that will take you to the highest standards of quality and success.

Through a very well-organized program, you will be able to access the most advanced knowledge in Drone Design and Piloting"

Module 1. Particularities of Drones

1.1. Applicable Legislation
- 1.1.1. In the World
  - 1.1.1.1. The ICAO
  - 1.1.1.2. JARUS

1.2. USA: The Paradigm
- 1.2.1. Requirements
- 1.2.2. Pilot Profiles
- 1.2.3. 2020 Innovations: LAANC

1.3. Europe
- 1.3.1. EASA: General Aspects
- 1.3.2. EASA: Particularities

1.4. Drones as Model Aircraft
- 1.4.1. Flight Categories
  - 1.4.1.1. Recreational Flight
  - 1.4.1.2. Free Flight F1
  - 1.4.1.3. Circular Flight F2
  - 1.4.1.4. Radio-Controlled Flight F3
  - 1.4.1.5. Scale Models F4
  - 1.4.1.6. Models with an Electric Motor F5
  - 1.4.1.7. Spatial Models S

1.5. Drones as Sport
- 1.5.1. Competitions
  - 1.5.2.1. International

1.6. Operational Applications of Drones in Engineering I
- 1.6.1. Applications in Cartography - Photogrammetry
- 1.6.2. Applications in Civil Engineering

1.7. Operational Applications of Drones in Engineering II
- 1.7.1. Applications in Thermography
- 1.7.2. Environmental Applications

1.8. Operational Applications of Drones in Engineering III
- 1.8.1. Applications in Mining
- 1.8.2. Applications in Inspections

1.9. Operational Applications of Drones in Engineering IV
- 1.9.1. Applications in Artistic Photography and Shows
- 1.9.2. Applications in Air, Radio and TV Advertising
- 1.9.3. Applications in Security and Emergencies
- 1.9.4. Applications in Agriculture

Module 2. Occupational Risk Prevention With Drones

2.1. Specific Regulations
- 2.1.1. Specific Regulations
- 2.1.2. Risk Assessment

2.2. Equipment and Machinery
- 2.2.1. Equipment
- 2.2.2. Machinery

2.3. Dangerous Goods Regulations (DGR)
- 2.3.1. Dangerous Goods
- 2.3.2. Classification and Action Taken in Accidents and Incidents with Dangerous Goods

2.4. Hygiene and Ergonomics
- 2.4.1. Hygiene
- 2.4.2. Ergonomics

2.5. PPE
- 2.5.1. PPE
- 2.5.2. Use

2.6. Emergency Situations
- 2.6.1. Self-Protection Plans
- 2.6.2. Actions to Take in Emergency Situations

2.7. Procedures in Cases of Occupational Accidents
- 2.7.1. Procedures in Cases of Occupational Accidents
- 2.7.2. Accident and Incident Investigations

2.8. Health Surveillance
- 2.8.1. Company Obligations
- 2.8.2. Emergency Planning

2.9. Outdoor Work
- 2.9.1. Hazards for People Working Outdoors
- 2.9.2. Preventive Measures for Outdoor Work

2.10. Work With Drones
- 2.10.1. Hazards for People Working With Drones
- 2.10.2. Preventive Measures for Working With Drones

Module 3. R&D&I: Aircraft Performance

3.1. Fixed-Wing Aircraft I
- 3.1.1. Energies Acting on the Aircraft
- 3.1.2. Forces Acting on the Aircraft

3.2. Fixed-Wing Aircraft II
- 3.2.1. Glide Ratio
- 3.2.2. Stability. Axis of an Aircraft
- 3.2.3. Center of Gravity and Center of Pressure
- 3.2.4. Loss and Auger

3.3. Rotary Wing Aircraft I
- 3.3.1. Energies Acting on the Aircraft
- 3.3.2. Forces Acting on the Aircraft

3.4. Rotary Wing Aircraft II
- 3.4.1. The Rotary System
- 3.4.2. Induced Oscillation
  - 3.4.2.1. PIO
  - 3.4.2.2. MIO
  - 3.4.2.3. AIO

3.5. Methodology for RPAS Flights
- 3.5.1. Preflight: Safety Check List
- 3.5.2. Take Off and Ascension
- 3.5.3. Cruise Control
- 3.5.4. Descent and Landing
- 3.5.5. After Landing

3.6. Flight Profiles and Operation Characteristics
- 3.6.1. Object
- 3.6.2. Operation Characteristics
- 3.6.3. What's Included in the Flight Preparation?
- 3.6.4. Normal Operation
- 3.6.5. Situations in Abnormal Conditions and Emergencies
- 3.6.6. Analysis and Closing of Flight Operations
- 3.6.7. Methodology for Creating Flight Profiles

3.7. Flight Planning: Risk Determination
- 3.7.1. Risk Factors
- 3.7.2. Put into Practice

3.8. Methodology for the Development of the EAS of Declarative Operations I
- 3.8.1. General Methodology

3.9. Methodology for the Development of the EAS of Declarative Operations II
- 3.9.1. SORA Methodology

Module 4. Design and Engineering I: Specific Knowledge of Drones

4.1. Aircraft Classification for the Pilot and the Engineer
- 4.1.1. Generic

4.2. Flight Principles for the Pilot and the Engineer
- 4.2.1. Exogenous Principles
  - 4.2.1.1. Bernoulli's Theorem, Venturi Effect, Action and Reaction Principle
- 4.2.2. Endogenous Principles
  - 4.2.2.1. The Plane, Airfoil, Angle of Attack, Boundary Layer, Performance

4.3. RPAS Requirements for the Pilot and the Engineer
- 4.3.1. Identification, Registration and Airworthiness
- 4.3.2. Records: Registration, Type and Special Certificates
- 4.3.3. Requirements

4.4. Design and Engineering: Characterization of the Aircraft
- 4.4.1. Aircraft Cell
- 4.4.2. On-Board Equipment
- 4.4.3. AGUILA-6 Characteristics

4.5. Basic Maintenance Theory for the Pilot and the Engineer
- 4.5.1. Object, Scope and Applicable Regulations
- 4.5.2. Contents

4.6. Design of Components of the Aircraft and Tools for Engineering
- 4.6.1. Components
- 4.6.2. Tools

4.7. Basic Maintenance Practice for the Pilot and the Engineer
  4.7.1. Limitations
4.8. Types of Revision in the Basic Maintenance for the Pilot and the Engineer
  4.8.1. Initial
  4.8.2. Periodical
4.9. Basic Aircraft and Ground Station Maintenance for the Pilot and Engineer
  4.9.1. Before the Flight
  4.9.2. After the Flight
4.10. Use of Lithium Polymer Batteries
  4.10.1. Charge, Use and Storage
  4.10.2. Basic Calculation of Autonomy

Module 5. Design and Engineering II: Advanced Maintenance of Drones

5.1. Introduction and Objectives of Maintenance for the Engineer
  5.1.1. Introduction
  5.1.2. Objectives
    5.1.2.1. Avoid Breakdown Shutdowns
    5.1.2.2. Avoid Anomalies Caused By Insufficent Maintenance
    5.1.2.3. Conservation
    5.1.2.4. Scope and Useful Life of Productive Assets
    5.1.2.5. Innovation, Technification and Automation of the Process
    5.1.2.6. Reduction of Business Costs
    5.1.2.7. Integration of Departments: Maintenance, Operations and R&D
5.2. Factors and Typologies for the Engineer
  5.2.1. Factors
    5.2.1.1. Company Resources
    5.2.1.2. Organization, Structure and Responsibilities
    5.2.1.3. Training
    5.2.1.4. Implantation and Management
    5.2.1.5. Coordination
  5.2.2. Typology
    5.2.2.1. Classification
    5.2.2.2. Preventative Maintenance
    5.2.2.3. Corrective Maintenance
    5.2.2.4. Predictive Maintenance
5.3. Preventative Maintenance Plan for Engineers
  5.3.1. Advantages
  5.3.2. Phases
  5.3.3. Programming
  5.3.4. Safety, Quality and Environmental Promise
5.4. Planned Maintenance Program. AGUILA-6 for the Pilot and the Engineer
5.5. Maintenance Control Systems
  5.5.1. Maintenance Theory
  5.5.2. Maintenance Organization
  5.5.3. Controlling the Maintenance Process
  5.5.4. Elements Related to the Concept of Control
  5.5.5. Good Control Requirements
  5.5.6. Applied Control Techniques
  5.5.7. Maintenance Management Process of a Company
  5.5.8. Administration and Control
  5.5.9. Maintenance Control in an Organization
5.6. Aircraft and Equipment Ground Operations
  5.6.1. Installation and Calibration Plan
  5.6.2. Put to Work: Before, During and After the Flight
5.7. Technological Installations of the Aircraft for the Engineer
  5.7.1. Mechanics
  5.7.2. Hydraulic
  5.7.3. Pneumatic
5.8. Electrical Installation for the Engineer
  5.8.1. Definition
  5.8.2. Technology: Taxonomy of the Drone
  5.8.3. Electronics
5.9. Document Management Systems for the Pilot and the Engineer
  5.9.1. Definition
  5.9.2. General and Specific Documents
  5.9.3. Obligatory Documents
5.10. Technical Documentation for Operation in Different Operational Scenarios

Module 6. Thermography with Drones I

6.1. Thermography and Drones
- 6.1.1. Definitions
- 6.1.2. Background

6.2. Physical Foundations of Infra Red Thermography
- 6.2.1. Transmission of Heat
- 6.2.2. Electromagnetic Radiation

6.3. Application in RPAS
- 6.3.1. Typology
- 6.3.2. Components of RPAS Systems

6.4. Integration in Unmanned Aerial Platforms
- 6.4.1. Choice of Camera
- 6.4.2. Image

6.5. Thermal Imaging Cameras
- 6.5.1. Functioning and Characteristics
- 6.5.2. Main Cameras on the Market

6.6. Application of Thermographic Images in Engineering
- 6.6.1. In Construction and Industry
- 6.6.2. In Agriculture and Livestock Farming
- 6.6.3. In Emergencies

6.7. Taking Thermographic Images
- 6.7.1. Taking Images
- 6.7.2. Calibration

6.8. Processing of Thermographic Data
- 6.8.1. Preliminary Process
- 6.8.2. Image Analysis

6.9. Visualization, Editing and Analysis Software
- 6.9.1. Flir Tools
- 6.9.2. Program Management

6.10. Most Frequent Errors
- 6.10.1. Taking Images
- 6.10.2. Image Interpretation

Module 7. Thermography with Drones II

7.1. Applied Theory
- 7.1.1. The Blackbody and Hot Spot
- 7.1.2. Radiation Theories

7.2. Infra Red Thermography II
- 7.2.1. Active Thermography and Passive Thermography
- 7.2.2. The Thermogram
- 7.2.3. Conditions of Application

7.3. Causes and Effects of the Measurement
- 7.3.1. Laws and Physical Principles
- 7.3.2. The Measured Object. Factors Affecting It

7.4. Temperature and Distortions
- 7.4.1. Measuring Systems and Units
- 7.4.2. Distortions

7.5. Software and Hardware
- 7.5.1. Software
- 7.5.2. Hardware

7.6. Missions
- 7.6.1. Static Mission: Wind Farms and Solar Plants
- 7.6.2. Dynamic Mission: Vigilance and Security

7.7. Social Actions
- 7.7.1. Fire Fighting
- 7.7.2. Rescue and Emergency

7.8. Analysis and Diagnosis
- 7.8.1. Interpretive Analysis and Diagnosis
- 7.8.2. Functional Analysis and Diagnosis

7.9. Reports
- 7.9.1. Thermographic Report
- 7.9.2. Field Analysis

7.10. Report to be Submitted
- 7.10.1. Equipment and Criteria
- 7.10.2. Report Example

Module 8. Geographic Information Technology for Drones

8.1. Particularities of Geographical Information Technology
- 8.1.1. Geographical Information Technology
- 8.1.2. Land Planning and Management

8.2. Hardware and Software. Implementation of Spatial Data
- 8.2.1. Physical Hardware Resources Applied to Work with RPAS
- 8.2.2. Logical Resources Software for Data Processing

8.3. Quality of Spatial Data. Data Sources and Resources
- 8.3.1. Notions on Spatial Data
- 8.3.2. Spatial Data Infrastructure (SDI)

8.4. Develop Coordinate Systems and Data Formats
- 8.4.1. Geographical Coordinates (Latitude, Longitude vs. UTM)
- 8.4.2. Vector and Raster Data

8.5. Geographical Information Systems (GIS) and RPAS
- 8.5.1. GIS
- 8.5.2. Implementation of RPAS Data in GIS

8.6. Application of GPS and GIS in Spatial Data Production
- 8.6.1. Spatial Data Base Management
- 8.6.2. Interoperability Between Data Management Devices

8.7. Practical Applications in the Development and Management of Real Estate
- 8.7.1. The Real Estate Cadastre

8.8. Practical Applications in the Development and Management of Land Use
- 8.8.1. Landscape and Land Uses
- 8.8.2. ICT and the Analysis of Land Use
- 8.8.3. CORINE Land Cover (Coordination of Information on the Environment)

8.9. Protected Natural Spaces
- 8.9.1. Conditions for the Use of RPA's in Protected Natural Spaces

8.10. Project Planning with RPAS and GIS for Land Planning and Management
- 8.10.1. Techniques and Methods of Project Planning

Module 9. Aerial Surveys and Photogrammetry with Drones

9.1. Principle Fundamentals Photogrammetry
- 9.1.1. Objectives of Photogrammetry and Aerial Surveys
- 9.1.2. Photogrammetry with Drones
- 9.1.3. Application of Photogrammetry with Drones
- 9.1.4. Results of Aerial Survery: Ortho-Mapping, Digital Surface Models, 3D Models, Point Clouds

9.2. Photography Concepts Applicable to Photogrammetry with Drones
- 9.2.1. General Photography, Focus, Lights, Precision
- 9.2.2. Digital Model Training
- 9.2.3. Three Fundamental Axis for Quality Surveys
  - 9.2.3.1. Focal Length
  - 9.2.3.2. Flight Altitude
  - 9.2.3.3. Sensor Size
  - 9.2.3.4. Mechanical Shutter vs. Electrical Shutter

9.3. Photogrammetry with Drones
- 9.3.1. Fundamental Concepts of Quality, Precision and Geographical Precision
- 9.3.2. Development of Aerial Surveys
  - 9.3.2.1. Image Acquisition
    - 9.3.2.1.1. Height
    - 9.3.2.1.2. Image Overlapping (Superimposition)
    - 9.3.2.1.3. Flight Speed
    - 9.3.2.1.4. Direction and Orientation of the Aircraft

9.4. Use of Ground Control Points
- 9.4.1. Objective for the Placement of Ground Control Points
- 9.4.2. UTM Zones
- 9.4.3. Measuring of Ground Control Points
- 9.4.4. Organization and Distribution of Control Points
- 9.4.5. Types of Visual Objectives of the Control Points and Recommendations

9.5. Drones and Recommended Equipment for Photogrammetry Aerial Surveys
- 9.5.1. Configuration of the Flight Parameters
- 9.5.2. Camera Configurations

9.6. Practical Survey
- 9.6.1. Weather Conditions for a Survey
- 9.6.2. Terrain Analysis
- 9.6.3. Extension and Area to be Covered
- 9.6.4. Light and Shade Management

9.7. DroneDeploy Software to Capture Autonomous Flight Images
- 9.7.1. Parameters to Establish
- 9.7.2. Creation of Autonomous Missions
- 9.7.3. Data Mining and Warehousing

9.8. Drone Flight and Data Collection
- 9.8.1. Safety and Pre-Flight Checks
- 9.8.2. Importing Missions
- 9.8.3. Enrichment of Models

9.9. Data Processing in DroneDeploy
- 9.9.1. Data Revision
- 9.9.2. Image Importing

9.10. Deliverables
- 9.10.1. Orthomaps
- 9.10.2. Point Cloud
- 9.10.3. Digital Models and Level Curves
- 9.10.4. Volumetric Measurement

Module 10. Operations Manual

10.1. Definition, Title Page and Table of Contents

10.2. Revisions Records
- 10.2.1. List of Effective Pages

10.3. Introduction
- 10.3.1. Responsible Declaration
- 10.3.2. Object and Scope
- 10.3.3. Definitions
- 10.3.4. Applicable Regulations

10.4. Administration and Control. Organization and Responsibilities
- 10.4.1. Administration and Control of the Operations Manual
  - 10.4.1.1. Amendments and Revisions
  - 10.4.1.2. Document Control
  - 10.4.1.3. Head of the Distribution and Control of Documents
- 10.4.2. Organization and Responsibilities
  - 10.4.2.1. Authorized Pilots
  - 10.4.2.2. Organizational Structure
  - 10.4.2.3. Responsibilities and Functions of the Management Personnel
  - 10.4.2.4. Functions and Responsibilities of the Members of the Organization

10.5. Requirements and Precautions
- 10.5.1. Qualification and Training Requirements
  - 10.5.1.1. Requirements for the Pilot
  - 10.5.1.2. Training and Previous Experience
  - 10.5.1.3. Training Program
  - 10.5.1.4. Training Records and Recurrent Training
  - 10.5.1.5. Aircraft Maintenance
- 10.5.2. Precautions Relative to Health of the Staff
  - 10.5.2.1. Precautions Relative to the Environmental Conditions of the Operations Zone
  - 10.5.2.2. Alcohol Intake
  - 10.5.2.3. Narcotics

10.5.2.4. Immunization
10.5.2.5. Blood Donation
10.5.2.6. Food Precautions
10.5.2.7. Sleep and Rest
10.5.2.8. Surgical Operations

10.6. Limitations and Type of Operation
10.6.1. Limitations of Flight Time
10.6.1.1. Maximum Activity
10.6.1.2. Excesses and Reduction of Rest Periods
10.6.1.3. Flight Records for Each Pilot
10.6.2. Types of Operation to Carry Out
10.6.2.1. List of Activities
10.6.2.2. Description of Operations and Aerial Work
10.6.2.3. Necessary Skills and/or Authorizations
10.6.2.4. Personnel, Fleet and Equipment Required

10.7. Control and Supervision of the Operations
10.7.1. Accident Prevention Program and Flight Safety
10.7.2. Emergency Measures
10.7.3. Validity of Authorizations and Permissions
10.7.4. Compliance with Pilot Requirements
10.7.5. Compliance with Mitigation Measures
10.7.6. The Aircraft
10.7.7. Operational Control
10.7.8. Authority Faculties

10.8. Procedures
10.8.1. Procedures
10.8.2. Monitoring of Air Operations
10.8.3. Completion of the Air Operation

10.9. Operational Aspects. Accidents and Incidents
10.9.1. Operational Aspects Related to the Type of Aircraft
10.9.2. Treatment, Notification and Report of Accidents, Incidents and Events

10.10. Security and Compliance With the Requirements
10.10.1. Security
10.10.1.1. Measures Adopted to Avoid Illicit Interference
10.10.1.2. Measures Adopted to Avoid Deliberate Interference of the Aircraft's Communication System
10.10.2. Ensuring the Compliance With the Requirements for the Operation
10.10.2.1. Measures and Procedures for the Verification of Compliance With the Necessary Requirements
10.10.2.2. Measures and Procedures to Verify That the Pilot Has All the Required Documentation to Carry Out the Operations

Module 11. Navigation and Interpretation of Maps

11.1. Fundamental Concepts
11.1.1. Definitions
11.1.2. Applications
11.1.3. Routometer

11.2. The Earth: Longitude, Latitude, Positioning
11.2.1. Geographical Coordinates
11.2.2. Positioning
11.2.3. Legislative Framework

11.3. Aeronautical Charts: Interpretation and Use
11.3.1. Aeronautical Charts
11.3.2. Typology of Aeronautical Charts
11.3.3. Projections of Aeronautical Charts

11.4. Navegation: Types and Technique
11.4.1. Types of Flight
11.4.2. Observed Navigation
11.4.2.1. Dead Reckoning Navigation

11.5. Navigation: Supports and Equipment
11.5.1. Navigation Aids
11.5.2. Applications
11.5.3. Equipment for Flights with RPAS

11.6. Limitations of Altitude and Distance. Use of Airspace
- 11.6.1. VLOS
- 11.6.2. BVLOS
- 11.6.3. EVLOS

11.7. GNSS. Use and Limitations
- 11.7.1. Description
- 11.7.2. Operation
- 11.7.3. Control and Accuracy. Limitations

11.8. GPS
- 11.8.1. Fundamentals and Functions of GLONASS and GPS
- 11.8.2. Differences Between GLONASS and GPS
- 11.8.3. GPS

11.9. AIP-ENAIRE Maps
- 11.9.1. ENAIRE
- 11.9.2. INSIGNIA. Online Aeronautical Information Maps
- 11.9.3. INSIGNIA VFR. Online Aeronautical Information Maps for VFR Flights

Module 12. Meteorology

12.1. Abbreviations
- 12.1.1. Definition
- 12.1.2. Abbreviations Applied to Aviation
- 12.1.3. Abbreviations and Definitions of the MET Services Guide

12.2. The Atmosphere
- 12.2.1. Thesis. Layers of the Atmosphere
- 12.2.2. Temperature, Density and Pressure
- 12.2.3. Cyclone. Anticyclone

12.3. Altimetry
- 12.3.1. Particularities and Fundamentals
- 12.3.2. Calculations with Instruments
- 12.3.3. Calculations without Instruments

12.4. Atmospheric Phenomena
- 12.4.1. Wind
- 12.4.2. Clouds
- 12.4.3. Fronts
- 12.4.4. Turbulence
- 12.4.5. Wind Shear

12.5. Visibility
- 12.5.1. Visibility on the Ground and in Flight
- 12.5.2. VMC Conditions
- 12.5.3. IMC Conditions

12.6. Meteorological Information
- 12.6.1. Low Elevation Charts
- 12.6.2. METAR
- 12.6.3. TAF
- 12.6.4. SPECI

12.7. Meteorological Previsions
- 12.7.1. TREND
- 12.7.2. SIGMET
- 12.7.3. GAMET
- 12.7.4. AIRMET

12.8. Solar Storms
- 12.8.1. Thesis
- 12.8.2. Features
- 12.8.3. Procedures for Obtaining Meteorological Information on Earth

12.9. Practical Procedures for Obtaining Meteorological Information
- 12.9.1. Before the Flight
- 12.9.2. During the Flight
- 12.9.3. VOLMET

Module 13. Human Factors for Remotely Piloted Aircraft

13.1. Aeronautical Psychology
- 13.1.1. Definition
- 13.1.2. Principles and Functions
- 13.1.3. Objectives

13.2. Positive Psychology
- 13.2.1. Definition
- 13.2.2. FORTE Model
- 13.2.3. FLOW Model
- 13.2.4. PERMA Model
- 13.2.5. EXPANSION Model
- 13.2.6. Potentials

13.3. Medical Requirements
- 13.3.1. Classification
- 13.3.2. Periods of Validity of Aeronautical Medical Certificates

13.4. Concepts and Good Practice
- 13.4.1. Objectives
- 13.4.2. Domains
- 13.4.3. Regulations
- 13.4.4. Considerations
- 13.4.5. Procedures
- 13.4.6. Drugs
- 13.4.7. Vision
- 13.4.8. Clinical Aspects

13.5. The Senses
- 13.5.1. The View
- 13.5.2. Structure of the Human Eye
- 13.5.3. Hearing: Definition and Schema

13.6. Situational Conscience
- 13.6.1. The Effect of Disorientation
- 13.6.2. The Illusion Effect
- 13.6.3. Other Exogenous and Endogenous Effects

13.7. Communication
- 13.7.1. Thesis
- 13.7.2. Factors of Communication
- 13.7.3. Elements of Communication
- 13.7.4. Assertiveness

13.8. Workload Management; Human Performance
- 13.8.1. Background and Consequences
- 13.8.2. Stress of General Adaptation Syndrom
- 13.8.3. Causes, Stages and Effects
- 13.8.4. Prevention

13.9. Teamwork
- 13.9.1. Description of Teamwork
- 13.9.2. Characteristics of Teamwork
- 13.9.3. Leadership

13.10. Health Aspects That Could Affect the RPAS Pilot
- 13.10.1. Disorientation
- 13.10.2. Illusions
- 13.10.3. Illnesses

Module 14. Operational Procedures

14.1. Operational Procedures of Flight
- 14.1.1. Operative Definition
- 14.1.2. Acceptable Means
- 14.1.3. Operational Procedure of the Flight

14.2. Operations Manual
- 14.2.1. Definition
- 14.2.2. Contents
- 14.2.3. Index

14.3. Operational Scenarios
- 14.3.1. Justification
- 14.3.2. Standard Scenarios
  - 14.3.2.1. For Night Flight: STSN01
  - 14.3.2.2. For Flight in a Controlled Airspace: STSE01
  - 14.3.2.3. Urban Scenarios
    - 14.3.2.3.1. For Flights in Built-Up Areas: STSA01
    - 14.3.2.3.2. For Flight in Built-Up Areas and a Controlled Airspace: STSA02
    - 14.3.2.3.3. For Flight in Built-Up Areas and an Atypical Airspace: STSA03
    - 14.3.2.3.4. For Flight in Built-Up Areas, a Controlled Airspace and Night Flight: STSA04
- 14.3.3. Experimental Scenarios
  - 14.3.3.1. For Experimental Flights in BVLOS in Segregated Airspace for Aircraft Weighing Less Than 25kg: STSX01
  - 14.3.3.2. For Experimental Flights in BVLOS in Segregated Airspace for Aircraft Weighing More Than 25kg: STSX02

14.4. Limitations Related to the Space in Which Its Operated
- 14.4.1. Maximum and Minimum Altitudes
- 14.4.2. Limitations of Maximum Distance of Operation
- 14.4.3. Meteorological Conditions

14.5. Operation Limitations
- 14.5.1. Relative to the Pilot
- 14.5.2. Relative to the Area of Protection and the Recovery Zone
- 14.5.3. Relative to the Objects and Dangerous Substances
- 14.5.4. Related to Flying Facilities

14.6. Flight Personnel
- 14.6.1. The Pilot in Charge
- 14.6.2. The Observer
- 14.6.3. The Operator

14.7. Operation Supervision
- 14.7.1. The Operation Manual
- 14.7.2. Objectives
- 14.7.3. Responsibility

14.8. Prevention of Accidents
- 14.8.1. The Operation Manual
- 14.8.2. General Safety Check List
- 14.8.3. Specific Safety Check List

14.9. Other Mandatory Compliance Procedures
- 14.9.1. Flight Time Records
- 14.9.2. Maintaining Remote Pilot Aptitude
- 14.9.3. Maintenance Records
- 14.9.4. Procedure to Obtain the Airworthiness Certificate
- 14.9.5. Procedure for Obtaining Special Certification for Experimental Flights

14.10. Procedure to Become an Operator
- 14.10.1. Qualification Procedure: Prior Communication
- 14.10.2. Procedure to Become an Operator: Specialized Air Operations or Experimental Flights
- 14.10.3. Operator Deregistration and Prior Notification

Module 15. Communications

15.1. Radiophonist Qualification for Remote Pilots
- 15.1.1. Theoretical Requirements
- 15.1.2. Practical Requirements
- 15.1.3. Programming

15.2. Emitters, Receptors and Antennae
- 15.2.1. Emitter
- 15.2.2. Receptors
- 15.2.3. Antennae

15.3. General Principles of Radio Transmission
- 15.3.1. Radio Transmission
- 15.3.2. Causality of Radio Communication
- 15.3.3. Radio Frequency Justification

15.4. Use of Radio
- 15.4.1. Guide to Radiophony at Uncontrolled Aerodromes
- 15.4.2. Practical Communication Guide
- 15.4.3. The Q Code
  - 15.4.3.1. Aeronautical
  - 15.4.3.2. Maritime
- 15.4.4. International Alphabet for Radio Communication

15.5. Aeronautical Vocabulary
- 15.5.1. Aeronautical Phrasing Applicable to Drones
- 15.5.2. English-Spanish
- 15.5.3. Spanish-English

15.6. Use of Radio Spectrum Frequencies
- 15.6.1. Definition of the Radio Spectrum
- 15.6.2. CNAF (Spanish National Frequency Allocation Chart)
- 15.6.3. Services

15.7. Aeronautical Mobile Service
- 15.7.1. Limitations
- 15.7.2. Messages
- 15.7.3. Cancellations

15.8. Radio-Telephonic Procedures
- 15.8.1. Language
- 15.8.2. Transmission, Verification and Pronunciation of Numbers
- 15.8.3. Message Transmission Technique

15.9. Communications With Air Traffic Control
- 15.9.1. Communications and Listening
- 15.9.2. Communications Failure in Airfield Traffic
- 15.9.3. Communications Failure in VMC or at Night

15.10. Air Transit Services
- 15.10.1. Classification of Airspace
- 15.10.2. Aeronautical Information Documents: NOTAM, AIP
- 15.10.3. Controlled, Uncontrolled and Segregated Airspace
- 15.10.4. ATC Instructions

Module 16. Dangerous Goods and Aviation

16.1. Application
- 16.1.1. General Philosophy
  - 16.1.1.1. Definition
  - 16.1.1.2. Historical Review
  - 16.1.1.3. General Philosophy
  - 16.1.1.4. Air Security in the Transport of Dangerous Goods
  - 16.1.1.5. Training
- 16.1.2. Regulation
  - 16.1.2.1. Basis of Regulation
  - 16.1.2.2. Aim of Regulation on Dangerous Goods
  - 16.1.2.3. Application of the Regulation
  - 16.1.2.4. Realtionship With ICAO
  - 16.1.2.5. Applicable Regulations in the Air Transport of Dangerous Goods
  - 16.1.2.6. IATA Regulations on Dangerous Goods
- 16.1.3. Application for Unmanned Aviation: Drones

16.2. Limitations
- 16.2.1. Limitations
  - 16.2.1.1. Limitations
  - 16.2.1.2. Prohibited Goods
  - 16.2.1.3. Goods Allowed Under Waiver
  - 16.2.1.4. Goods Allowed as Air Cargo
  - 16.2.1.5. Acceptable Goods
  - 16.2.1.6. Exempt Goods
  - 16.2.1.7. Plane Equipment
  - 16.2.1.8. On-Board Consumption Goods
  - 16.2.1.9. Goods in Excepted Quantities
  - 16.2.1.10. Goods in Limited Quantities
  - 16.2.1.11. Provisions for Dangerous Goods Carried by Passengers or Crews
- 16.2.2. Variations Among States
- 16.2.3. Variations Among Operators

16.3. Classification
- 16.3.1. Classification
  - 16.3.1.1. Class 1: Explosives
  - 16.3.1.2. Class 2: Gases
  - 16.3.1.3. Class 3: Inflammable Liquids
  - 16.3.1.4. Class 4: Inflammable Solids
  - 16.3.1.5. Class 5: Oxidizing Substances and Organic Peroxides
  - 16.3.1.6. Class 6: Toxic and Infectious Substances
  - 16.3.1.7. Class 7: Radioactive Material
  - 16.3.1.8. Class 8: Corrosives
  - 16.3.1.9. Miscellaneous or Assorted Goods
- 16.3.2. Exceptions: Permitted Goods
- 16.3.3. Exceptions: Prohibited Goods

16.4. Identification
- 16.4.1. Identification
- 16.4.2. Dangerous Goods List
- 16.4.3. Name of Item Shipped
- 16.4.4. Generic Name

16.4.5. Mixtures and Solutions
16.4.6. Special Provisions
16.4.7. Quantity Limitations
16.5. Packaging
16.5.1. Packaging Instructions
16.5.1.1. Introduction
16.5.1.2. General Conditions for All Classes Except Class 7
16.5.1.3. Compatibility Requirements
16.5.2. Packaging Groups
16.5.3. Packaging Brands
16.6. Packaging Specifications
16.6.1. Packaging Specifications
16.6.1.1. Features
16.6.1.2. Interior Packaging Features
16.6.2. Packaging Tests
16.6.2.1. Suitability Testing
16.6.2.2. Preparation of Packaging for the Tests
16.6.2.3. Area of Impact
16.6.2.4. Stacking Test
16.6.3. Test Reports
16.7. Branded and Labelled
16.7.1. Branding
16.7.1.1. Specifications and Requirements of Branding
16.7.1.2. Packaging Brands Specification
16.7.2. Labelling
16.7.2.1. The Need to Put Labels
16.7.2.2. Attaching the Labels
16.7.2.3. Labelling on Packaging
16.7.2.4. Labelling of Class or Division
16.7.3. Labelling Specifications
16.8. Documentation
16.8.1. Shipper's Declaration
16.8.1.1. Cargo Acceptance Procedure
16.8.1.2. Acceptance of Dangerous Goods by the Operator
16.8.1.3. Verification and Acceptance
16.8.1.4. Acceptance of Containers and Cargo Units
16.8.1.5. Shipper's Declaration
16.8.1.6. Air Waybill
16.8.1.7. Conservation of Documents
16.8.2. NOTOC
16.8.2.1. NOTOC
16.8.3. Event, Accidents and Incidents Report
16.9. Management
16.9.1. Management
16.9.1.1. Storage
16.9.1.2. Incompatibilities
16.9.2. Stowage
16.9.2.1. Handling of Packages Containing Liquid Dangerous Goods
16.9.2.2. Loading and Securing of Dangerous Goods
16.9.2.3. General Load Conditions
16.9.2.4. Magnetized Material Load
16.9.2.5. Dry Ice Load
16.9.2.6. Stowage of Living Animals
16.9.3. Handling Radioactive Goods
16.10. Radioactive Material
16.10.1. Definition
16.10.2. Classification
16.10.3. Determination of the Level of Activity
16.10.4. Determination of Other Features of the Material

Module 17. Engineering Technology in Flight

17.1. Particularities
- 17.1.1. Aircraft Description
- 17.1.2. Motor, Propeller, Rotor(s)
- 17.1.3. Three-View Plan
- 17.1.4. Systems That Form Part of the RPAS (Ground Control Station, Catapults, Nets, Additional Information Displays, etc.)

17.2. Limitations
- 17.2.1. Mass
  - 17.2.1.1. Maximum Mass
- 17.2.2. Speed
  - 17.2.2.1. Maximum Speed
  - 17.2.2.2. Loss of Speed
- 17.2.3. Limitations of Altitude and Distance
- 17.2.4. Maneuvering Load Factor
- 17.2.5. Mass and Centering Limits
- 17.2.6. Authorized Maneuvers
- 17.2.7. Drive Unit, Propellers, Rotor, If Applicable
- 17.2.8. Maximum Potential
- 17.2.9. Engine, Propeller, Rotor Speed
- 17.2.10. Environmental Limitations of Use (Temperature, Altitude, Wind, Electromagnetic Environment)

17.3. Abnormal and Emergency Procedures
- 17.3.1. Engine Failure
- 17.3.2. Restarting an Engine in Flight
- 17.3.3. Fire
- 17.3.4. Gliding
- 17.3.5. Self-Rotation
- 17.3.6. Emergency Landing
- 17.3.7. Other Emergencies
  - 17.3.7.1. Loss of a Means of Navigation
  - 17.3.7.2. Loss of Connection With Flight Control
  - 17.3.7.3. Others
- 17.3.8. Safety Devices

17.4. Normal Procedures
- 17.4.1. Pre-Flight Revision
- 17.4.2. Put to Work
- 17.4.3. Take-Off
- 17.4.4. Cruise Control
- 17.4.5. Hovering
- 17.4.6. Landing
- 17.4.7. Engine Shutdown After Landing
- 17.4.8. Post-Flight Revision

17.5. Loans
- 17.5.1. Take-Off
- 17.5.2. Limit of Crosswind at Take-off
- 17.5.3. Landing
- 17.5.4. Limit of Crosswind When Landing

17.6. Weight and Centering, Equipment
- 17.6.1. Reference Unladen Mass
- 17.6.2. Vacuum Reference Centering
- 17.6.3. Configuration for the Determination of Mass in Vacuum
- 17.6.4. List of Equipment

17.7. Assembly and Adjustment
- 17.7.1. Instructions for Assembly and Adjustment
- 17.7.2. List of User-Accessible Settings and Consequences on Flight Characteristics
- 17.7.3. Impact of the Installation of Any Special Equipment Related to a Particular Use

17.8. Software
- 17.8.1. Identification of Versions
- 17.8.2. Verification of its Correct Functioning
- 17.8.3. Updates
- 17.8.4. Programming
- 17.8.5. Aircraft Adjustments

17.9. Safety Study for Declarative Operations
- 17.9.1. Records
- 17.9.2. Methodology
- 17.9.3. Operations Description
- 17.9.4. Risk Evaluation
- 17.9.5. Conclusions

17.10. Applicability: From Theory to Practice
- 17.10.1. Flight Syllabus
- 17.10.2. Expert Testing
- 17.10.3. Maneuvers

Module 18. Integration of Drones for Industry and Practical Uses

18.1. Advanced Air Photography and Video
- 18.1.1. The Triangle of Exposition
- 18.1.2. Histograms
- 18.1.3. Use of Filters
- 18.1.4. Camera Settings
- 18.1.5. Delivered to Clients

18.2. Advanced Applications of Photography
- 18.2.1. Panoramic Photography
- 18.2.2. Low-Light and Night Shots
- 18.2.3. Interior Videos

18.3. Drones in the Construction Industry
- 18.3.1. Expectations of the Industry and Budgets
- 18.3.2. Solutions
- 18.3.3. Automated Image Taking

18.4. Risk Assessment With Drones
- 18.4.1. Air Inspection
- 18.4.2. Digital Modes
- 18.4.3. Safety Procedures

18.5. Inspection Work With Drones
- 18.5.1. Inspection of Roofs and Covers
- 18.5.2. The Appropriate Drone
- 18.5.3. Inspection of Paths, Roads, Highways and Bridges

18.6. Surveillance and Security With Drones
- 18.6.1. Principles for Implementing a Program With Drones
- 18.6.2. Factors to Consider When Buying a Drone for Safety
- 18.6.3. Applications and Real Uses

18.7. Search and Rescue
- 18.7.1. Plan
- 18.7.2. Tools
- 18.7.3. Basic Knowledge of the Pilots and Operators for Search and Rescue Missions

18.8. Drones in Precision Agriculture I
- 18.8.1. Particularities of Precision Agriculture
- 18.8.2. Normalized Difference Vegetation Index
  - 18.8.2.1. Visible Atmospheric Resistance Index (VARI)

18.9. Drones in Precision Agriculture II
- 18.9.1. Drones and Applications
- 18.9.2. Drones for Monitoring in Precision Agriculture
- 18.9.3. Techniques Applied in Precision Agriculture

18.10. Drones in Precision Agriculture III
- 18.10.1. Image Acquisition Process for Precision Agriculture
- 18.10.2. Process of Photogrammetry and Application of the Visible Atmospheric Resistance Index
- 18.10.3. Interpretation of the Vegetation Indices

06

Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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.

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.

Relearning Methodology

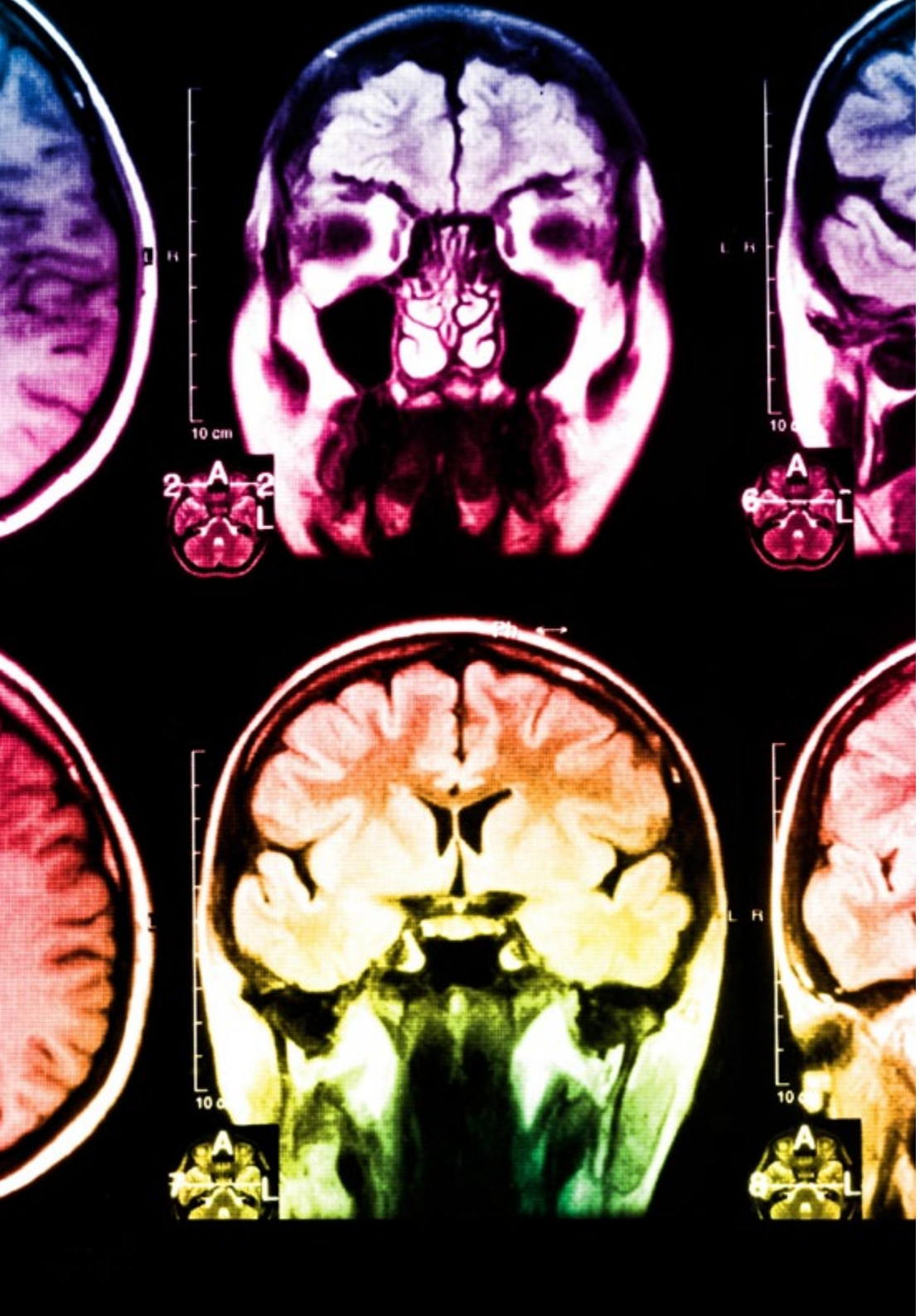
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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.



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.

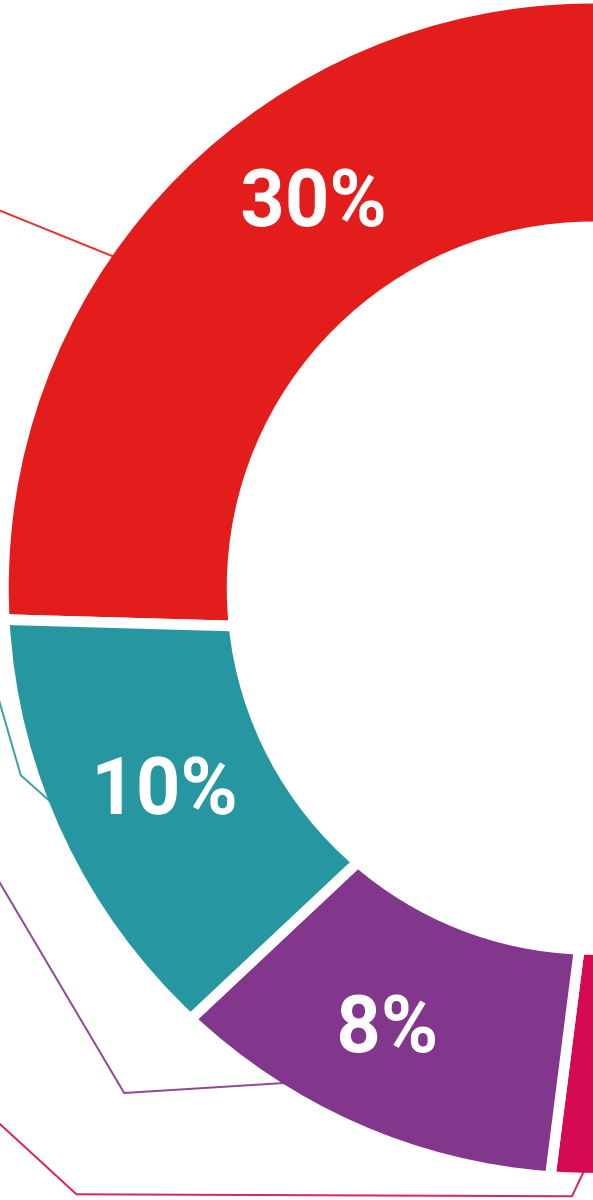
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

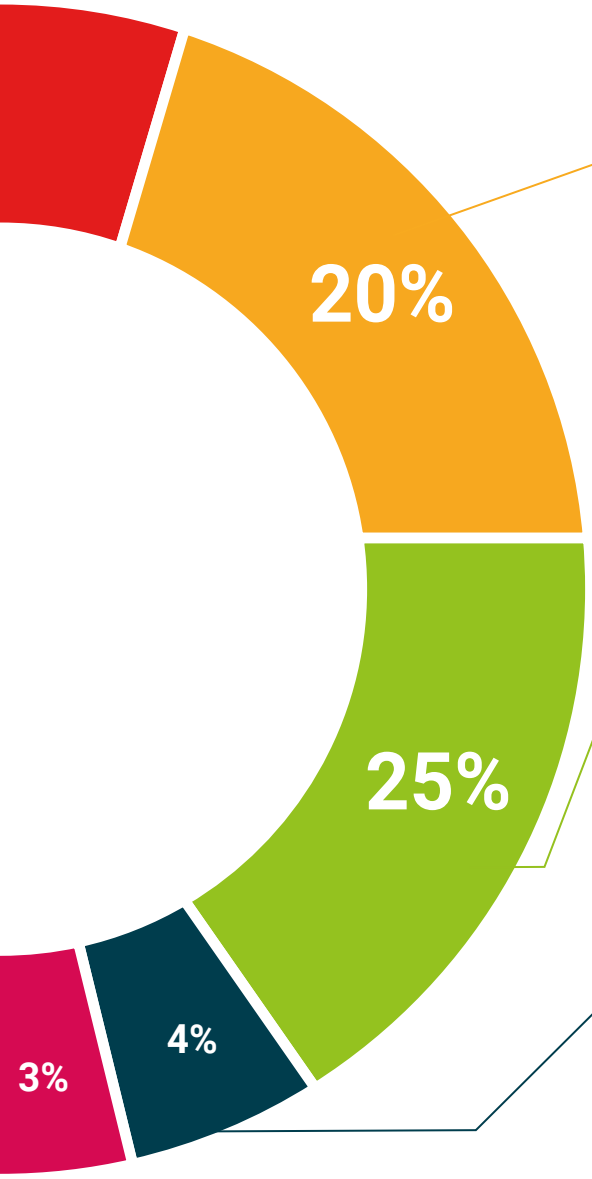
Practising Skills and Abilities

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.





Case Studies

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.

07

Certificate

The Advanced Master's Degree in Drone Design and Piloting guarantees you, in addition to the most rigorous and up-to-date training, access to a Advanced Master's Degree issued by TECH Global University.

Successfully complete this program and receive your university degree without travel or laborious paperwork”

This program will allow you to obtain your **Advanced Master's Degree diploma in Drone Design and Piloting** endorsed by **TECH Global University**, the world's largest online university.

TECH Global University is an official European University publicly recognized by the Government of Andorra (***official bulletin***). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Advanced Master's Degree in Drone Design and Piloting**

Modality: **online**

Duration: **2 years**

Accreditation: **120 ECTS**


tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Advanced Master's Degree in Drone Design and Piloting

This is a program of 3,000 hours of duration equivalent to 120 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates


Advanced Master's Degree in Drone Design and Piloting

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Particularities of Drones	7	CO
1º	Occupational Risk Prevention With Drones	7	CO
1º	R&D&I: Aircraft Performance	7	CO
1º	Design and Engineering I: Specific Knowledge of Drones	7	CO
1º	Design and Engineering II: Advanced Maintenance of Drones	7	CO
1º	Thermography with Drones I	7	CO
1º	Thermography with Drones II	7	CO
1º	Geographic Information Technology for Drones	7	CO
1º	Aerial Surveys and Photogrammetry with Drones	7	CO

Year	Subject	ECTS	Type
2º	Operations Manual	7	CO
2º	Navigation and Interpretation of Maps	7	CO
2º	Meteorology	7	CO
2º	Human Factors for Remotely Piloted Aircraft	6	CO
2º	Operational Procedures	6	CO
2º	Communications	6	CO
2º	Dangerous Goods and Aviation	6	CO
2º	Engineering Technology in Flight	6	CO
2º	Integration of Drones for Industry and Practical Uses	6	CO

Dr. Pedro Navarro Illana
Rector

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*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

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Advanced Master's Degree
Drone Design and Piloting

- Modality: **online**
- Duration: **2 years**
- Certificate: **TECH Global University**
- Credits: **120 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Advanced Master's Degree
Drone Design and Piloting

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