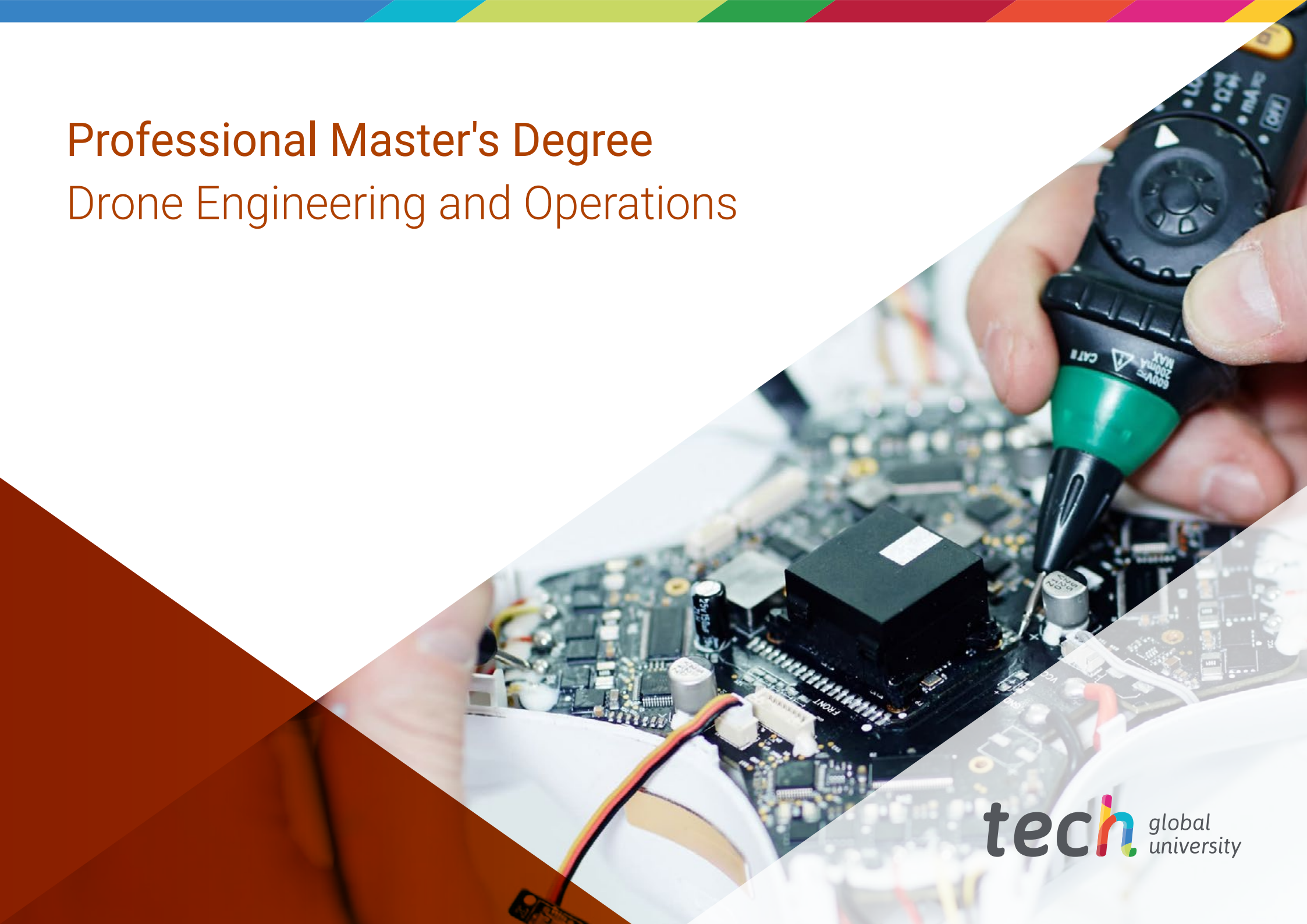
Professional Master's Degree

Drone Engineering and Operations



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Professional Master's Degree
Drone Engineering and Operations

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Accreditation: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/engineering/professional-master-degree/master-drone-engineering-operations**

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01

Introduction

The drone market is helping government agencies and academies to reinvent themselves in the aeronautical world. Engineers involved in this field must have the most up-to-date skillsets in terms of maintenance and working with circuits, sensor systems or electronic board design. They must also know the applicable legislation, management and work areas where drones can be highly efficient tools. This up-to-date and high-quality program brings students closer to the field of Drone Engineering and Operations. A comprehensive specialization program that seeks to specialize students to be successful in their profession.

A comprehensive and fully up-to-date Professional Master's Degree through which students can specialize in all areas of work with drones, from the technical aspects to managing and implementing them in different sectors"

The world of aeronautics has changed with the emergence of drones. Drone technology is advancing at great speed, evolving much faster even than mobile technology. This technology has advanced so much that, nowadays, there are drones with more than 20 hours of flight autonomy.

Moreover, the advance of drones implies a growing need for pilots and other professionals to specialize in their use. Flying a drone for entertainment purposes is not the same as flying a high value drone for specialized operations. That is why this intensive program is so vital, as it will provide professionals with the specialization that they need.

This program is aimed at those interested in attaining a higher level of knowledge of Drone Engineering and Operations. The main objective is to specialize students so that they can apply the knowledge acquired in this program in the real world, in a work environment that reproduces the conditions they may encounter in their future, in a rigorous and realistic manner.

Additionally, as it is a 100% online program, the student is not constrained by fixed schedules or the need to move to another physical location, but can access the contents at any time of the day, balancing their professional or personal life with their academic life.

This **Professional Master's Degree in Drone Engineering and Operations** contains the most complete and up-to-date program on the market. The most important features include:

- Practical cases presented by experts in Drone Engineering and Operations
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the essential disciplines for professional practice
- Practical exercises where the self-assessment process can be carried out to improve learning
- Special emphasis on innovative methodologies in Drone Engineering and Operations
- 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

Designed to be a complete compilation of theoretical and practical knowledge, this Professional Master's Degree will boost your real and effective capacity in this field of work"

With a system created to turn your effort into results in the shortest possible time, this Professional Master's Degree is the best option to boost your career"

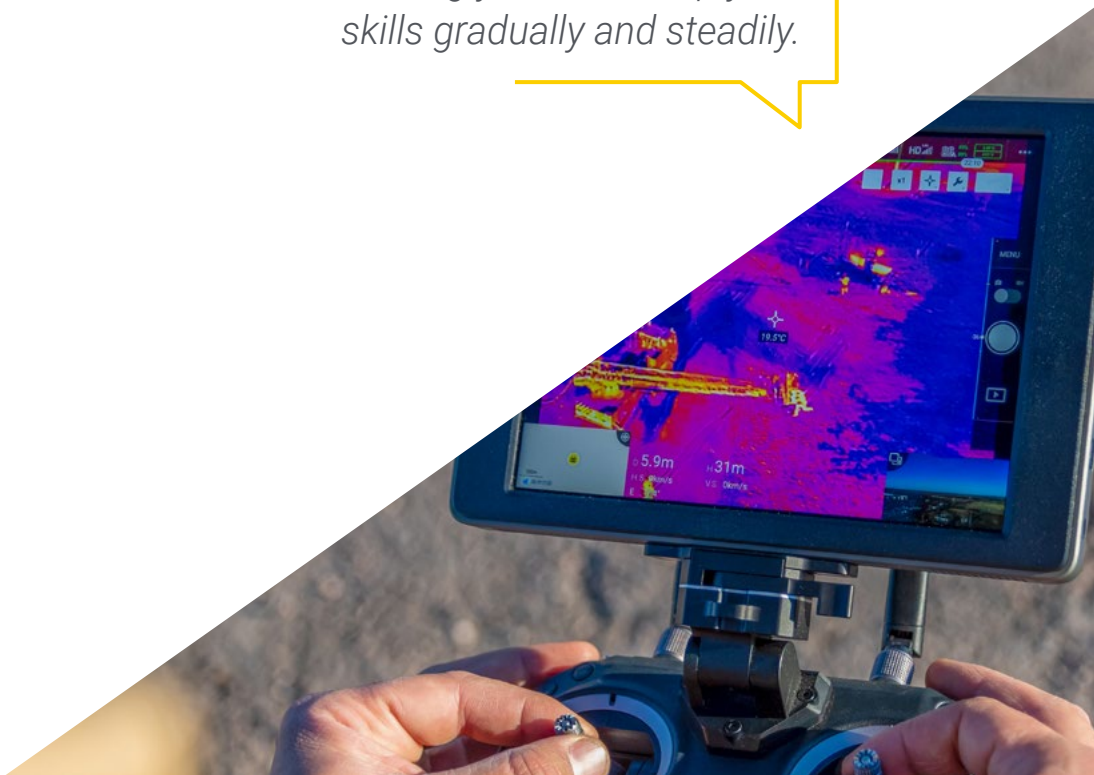
This 100% online Professional Master's Degree will allow you to balance your studies with your professional work. You choose where and when to study.

During your studies you will have access to quality teaching materials and the learning systems from leading universities, allowing you to develop your skills gradually and steadily.

The teaching staff includes professionals in the field of Drone Engineering and Operations who bring their experience to this program, as well as renowned specialists from leading societies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will allow the professional a situated and contextual learning, that is to say, a simulated environment that will provide an immersive specialization, programmed to specialize in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations, that arise throughout the program. For this purpose, the professional will be assisted by an innovative, interactive video system created by renowned and experienced Drone Engineering and Operations experts.



02

Objectives

The Drone Engineering and Operations program aims to specialize engineering professionals in the specific aspects involved in this field, offering them a specialized development of high impact for its development and application. A high-quality program that will optimize effort by converting it quickly into results.

The objective of this Professional Master's Degree is to specialize competent professionals in Drone Engineering and Operations who will respond to the current requirements of the industry"

General Objectives

- Specify and establish a joint vision of unmanned aviation in the world and, more specifically, in Europe and the US A
- Delimit the roles of 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 professional actions necessary to respond to universal accessibility and "design for all"
- Identify and apply quality parameters in the work and activities performed during the learning process to assess the culture of assessment and quality and to monitor and improve quality management procedures
- Specify the role and responsibilities of an aeronautical operator. Detail the internal and management operations of this "small airline" in relation to the aeronautical authority
- Use procedures related to entrepreneurial culture, business and professional initiative to carry out basic small company management or start a new business
- Recognize their rights and duties as active agents in society, taking into account the legal framework that regulates social and labor conditions, in order to participate as democratic citizens

Take the opportunity and get up-to-date on the latest developments in Drone Engineering and Operations”

Specific Objectives

Module 1. Particularities of Drones

- Acquire a particular vision of the peculiarities and features of world legislation and, more specifically, that of Europe and the US A
- Present the different uses of drones in different modalities such as: training, model airplanes and sport
- Structure, organize and define the different institutions that regulate non-professional use of drones
- Implement and taxonomize the different professional applications of drones in functional operations through engineering: from cartography to agriculture, photogrammetry, civil engineering, thermography, environment, mining, various inspections, photography, advertising and emergency situations

Module 2. Occupational Risk Prevention With Drones

- Identify the specifc regulatory framework. BORRAR
- 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 dangers of outdoor and drone work to present prevention measures

Module 3. R&D&I: Aircraft Performance

- Recognize the importance of unmanned aerial platform performance for aerial activity
- Develop basic skills and aptitudes in the knowledge of the origin of Remotely Piloted Aircraft System (RPAS) performance
- Recognize the necessary features of an unmanned aircraft to perform safe flights in different scenarios
- Identify required features in unmanned aircrafts to perform safe flights with different configurations and other influencing factors
- Detail the forces and energies acting on an aircraft in the different phases of flight

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

- Delve into the basic principles of flight from the laws of physics, specifically from aerodynamics
- Develop aptitude in the knowledge of basic unmanned aircrafts components, how they function and their potential
- Learn about the components and equipment requirements in unmanned aircrafts
- Delve into the importance of maintenance, as well as its obligatory nature and limitations

Module 5. Design and Engineering II: Advanced Drone Maintenance

- Ensure that all operations comply with flight safety
- Raise awareness of the importance and the obligation to carry out aircraft maintenance according to the operator's instructions
- Raise awareness of the importance and mandatory nature of 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
- Interpret the administrative registration models and fill them in according to current legislation
- 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 Transport Technology and Associated Services (TTAS)
- Visualize, edit and analyze the infra-red images taken with the proposed software
- Identify the most frequent mitigation errors in deliverable products to the final customer

Module 7. Thermography with Drones II

- Develop thermal imaging analysis as a foundation for various applications
- Identify thermal technology capabilities and implementation
- Develop field work methodologies to generate effective diagnostics
- Enhance image analyst skills 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 future, immediately applicable, remedial actions
- 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 technology for spatial data collection
- Manage spatial data, its sources and resources
- Develop coordinate systems and data formats
- Detail geographic information systems with drones
- Design specific missions for land use management and land use planning

Module 9. Aerial Surveys and Photogrammetry with Drones

- Know the fundamental principles of photogrammetry
- Specifically delve into the fundamentals and operations of photogrammetry with drones
- Define the different flight and camera options to carry out missions
- Analyze, in a practical way, exogenous conditions
- Identify and interpret the software options proposed for particular jobs
- 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 planning, organization, management, coordination and control of 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 competences to implement operator configurations under safety standards

03

Skills

This Professional Master's Degree in Drone Engineering and Operations has been created as a high-quality specialization tool for professionals. This intensive specialization will enable them to work in all the fields related to this area with the confidence of an expert in the field.

Acquire the skills of a drone expert, both in terms of technical aspects as well as piloting and practical applications, with this quality, high-impact educational program"

General Skill

- Develop applications in Drone Engineering and Operations

Specialize in the world's largest online university"

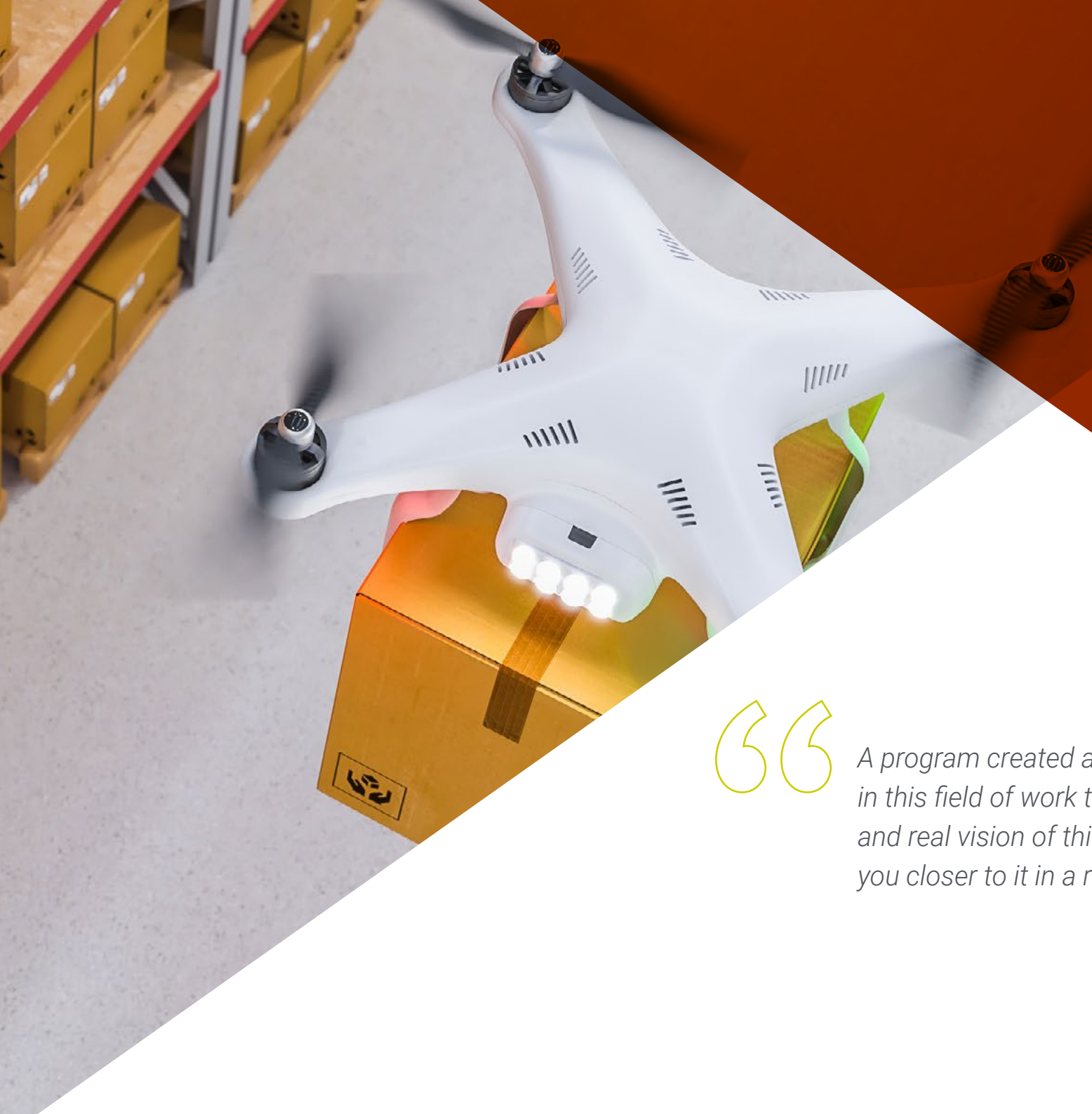
Specific Skills

- Obtain the qualification for the maintenance of remotely piloted aircrafts
- Respond to engineering needs, with practical applications in aerial operations with drones
- Select the technical documentation required according to the operation to be performed, 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 maintain the components that make up the aircrafts, complying with specific aeronautical regulations
- Perform aircraft weighing operations
- Organize and manage maintenance activities
- Perform stock control for the management of spare parts in the warehouse
- Perform operations in the manufacturing and assembly processes of parts and components of engines, structures and aircraft systems
- Perform inspection and quality control activities in the manufacture and assembly of engines, structures, aircraft systems and their components, as well as in maintenance operations, complying with specific aeronautical regulations

04

Course Management

In keeping with the total quality standard of this Professional Master's Degree, TECH is proud to provide students with a teaching staff of the highest level, who were selected for their proven experience. Professionals from different areas and fields of expertise that make up a complete, multidisciplinary team. A unique opportunity to learn from the best.



A program created and taught by specialists in this field of work that will give you a close and real vision of this profession, bringing you closer to it in a realistic and direct way"

Management

Mr. Pliego Gallardo, Ángel Alberto

- Airline Transport Pilot (ATPL)
- PPL (A), ULM, RPAS Pilot
- RPAS theoretical and practical instructor and examiner
- 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 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)
- EASA Authorized RPAS Manufacturer

Mr. Bazán González, Gerardo

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

Mr. Saiz Moro, Víctor

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

Professors

Ms. López Amedo, Ana María

- 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

Mr. Fernández Moure, Rafael L.

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

Mr. Buades Blasco, Jerónimo

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

05

Structure and Content

The syllabus has been designed based on educational efficiency, carefully selecting the contents to offer a comprehensive course, which includes all the fields of study that are essential to achieve real knowledge of the subject. Including the latest updates and aspects of the field.

A complete syllabus, which covers each and every one of the areas of interest for professionals who want to work with drones as a high-level specialist"

Module 1. Particularities of Drones

1.1. Applicable Legislation
- 1.1.1. International Legislation
  - 1.1.1.1. The ICAO
  - 1.1.1.2. JARUS

1.2. U.S.A. 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 Aeromodels
- 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. Types of Aeromodels
- 1.5.1. Trainers
- 1.5.2. Acrobatic
- 1.5.3. FunFly
- 1.5.4. Models

1.6. Drones as Sport
- 1.6.1. FAI
  - 1.6.1.1. Modalities
    - 1.6.1.1.1. Persecution
    - 1.6.1.1.2. Free Style
- 1.6.2. Competitions
  - 1.6.2.1. Relations
  - 1.6.2.2. National

1.7. Drones Operational Applications in Engineering I
- 1.7.1. Applications in Cartography-Photogrammetry
- 1.7.2. Applications in Civil Engineering

1.8. Drones Operational Applications in Engineering II
- 1.8.1. Applications in Thermography
- 1.8.2. Environmental Applications

1.9. Drones Operational Applications in Engineering III
- 1.9.1. Applications in Mining
- 1.9.2. Inspection Applications

1.10. Drones Operational Applications in Engineering IV
- 1.10.1. Applications in Artistic Photography and Shows
- 1.10.2. Applications in Aerial Advertising, Radio and TV
- 1.10.3. Security and Emergency Applications
- 1.10.4. Applications in Agriculture

Module 2. Occupational Risk Prevention With Drones

2.1. Equipment and Machinery
- 2.1.1. Equipment
- 2.1.2. Machinery

2.2. Dangerous Goods Regulations (DGR)
- 2.2.1. Dangerous Goods
- 2.2.2. Classification and Action Taken in Accidents and Incidents with Dangerous Goods

2.3. Hygiene and Ergonomics
- 2.3.1. Hygiene
- 2.3.2. Ergonomics

2.4. PPE
- 2.4.1. PPE
- 2.4.2. Use

2.5. Emergency Situations
- 2.5.1. Self-Protection Plans
- 2.5.2. Actions to Take in Emergency Situations

2.6. Procedures in Cases of Occupational Accidents
- 2.6.1. Procedures in Cases of Occupational Accidents
- 2.6.2. Accident and Incident Investigations

2.7. Health Surveillance
- 2.7.1. Company Obligations
- 2.7.2. Emergency Plan

2.8. Outdoor Work
- 2.8.1. Hazards for People Working Outdoors
- 2.8.2. Preventive Measures for Outdoor Work

2.9. Work With Drones
- 2.9.1. Hazards for People Working With Drones
- 2.9.2. 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 Oscillations:
3.4.2.1. IOP
3.4.2.2. MIO
3.4.2.3. AIO
3.5. RPAS Flying Methodology
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. Flight Preparation: What Does it Involve?
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. Implementation
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
3.10. Requirements Established in RD 1036/2017 for EAS. BORRAR

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

4.1. Aircraft Classification for Pilots and Engineers
4.1.1. Generic
4.1.2. According to AESA BORRAR
4.2. Flight Principles for Pilots and Engineers
4.2.1. Exogenous Principles
4.2.1.1. Bernoulli's Theorem, Venturi's 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 Pilots and Engineers
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. Eagle-6 Characterization
4.5. Basic Maintenance Theory for Pilots and Engineers
4.5.1. Object, Scope and Applicable Regulations
4.5.2. Content
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 Pilots and Engineers
4.7.1. Limitations
4.8. Types of Basic Maintenance Checks for Pilots and Engineers
4.8.1. Initial
4.8.2. Periodical
4.9. Basic Aircraft and Ground Station Maintenance for Pilots and Engineers
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 Drone Maintenance

5.1. Maintenance Introduction and Objectives for Engineers
5.1.1. Introduction
5.1.2. Objectives
5.1.2.1. Avoid Breakdown Shutdowns
5.1.2.2. Avoid Anomalies Caused By Insufficient 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. Department Integration: Maintenance, Operations and R&D
5.2. Factors and Typologies for Engineers
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. Commitment to Safety, Quality and Environment
5.4. Planned Maintenance Program. Eagle-6 for Pilots and Engineers
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. Corporate Maintenance Management Process
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 Aircraft Facilities for Engineers
5.7.1. Mechanics
5.7.2. Hydraulic
5.7.3. Pneumatics
5.8. Electrical Installation for Engineers
5.8.1. Definition
5.8.2. Technology: Taxonomy of the Drone
5.8.3. Electronics
5.9. Document Management Systems for Pilots and Engineers
5.9.1. Definition
5.9.2. General and Specific Documents
5.9.3. Obligatory Documents
5.10. Simulation of Practical Scenarios for the Application of RD1036/2017 BORRAR
5.10.1. Identification
5.10.2. Operative Restrictions Applicable to the Aircraft

5.10.3. Technical Requirements for Operation in Different Operational Scenarios
5.11. 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 Basics of Infrared Thermography
6.2.1. Transmission of Heat
6.2.2. Electromagnetic Radiation
6.3. Application in RPAS
6.3.1. Typology
6.3.2. RPAS Components
6.4. Integration in Unmanned Aerial Platforms
6.4.1. Choice of Camera
6.4.2. Image
6.5. Thermal Cameras
6.5.1. Functioning and Characteristics
6.5.2. Main Cameras on the Market
6.6. Applications in Thermal Imaging 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 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. Physical Laws and 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 Applications
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. Thermal Reports
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. Geographic Information Technology Features
8.1.1. Geographic Information Technologies
8.1.2. Spatial 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)
8.3.3. National Center of Geographical Information (CNIG)
8.4. Develop Coordinate Systems and Data Formats
8.4.1. Geographic Coordinates (Latitude, Longitude vs. UTM)
8.4.2. Vector and Raster Data
8.5. Geographic Information Systems (GIS) and RPAS
8.5.1. GIS
8.5.2. Implementing RPAS Data in GIS
8.6. Application of GPS and GIS in Spatial Data Production
8.6.1. Spatial Database Management
8.6.2. Interoperability Between Data Management Devices
8.7. Practical Applications in the Development and Management of Real Estate
8.7.1. Real Estate Registry
8.7.2. The Geographic Information System for Agricultural Parcels (SIGPAC)
8.8. Practical Applications in the Development and Management of Land Use
8.8.1. Landscape and Land Use
8.8.2. ICT and Land Use Analysis
8.8.3. CORINE Land Cover *(Coordination of Information on the Environment)*
8.8.4. Information Systems on the Use of Land in Spain (SIOSE)
8.9. Protected Natural Areas
8.9.1. Conditions of RPAS Use in Protected Natural Spaces
8.10. RPAS and GIS Project Planning for Land Use 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. Aerial Survey Results: Orthomaps, Digital Surface Models, 3D Models, and 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
9.3.4. 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. Administration and Control. Organization and Responsibilities
10.3.1. Administration and Control of the Operations Manual
10.3.1.1. Amendments and Revisions
10.3.1.2. Document Control
10.3.1.3. Head of the Distribution and Control of Documents
10.3.2. Organization and Responsibilities
10.3.2.1. Authorized Pilots
10.3.2.2. Organizational Structure
10.3.2.3. Responsibilities and Functions of the Management Personnel
10.3.2.4. Roles and Responsibilities of the Members within the Organization:
10.4. Requirements and Precautions
10.4.1. Qualification and Training Requirements
10.4.1.1. Requirements for the Pilot
10.4.1.2. Training and Previous Experience
10.4.1.3. Training Program
10.4.1.4. Training Records and Recurrent Training
10.4.1.5. Aircraft Maintenance
10.4.2. Precautions Relative to Health of the Staff
10.4.2.1. Precautions for Environmental Conditions in the Operation Zone
10.4.2.2. Alcohol Intake
10.4.2.3. Narcotics
10.4.2.4. Immunization
10.4.2.5. Blood Donation
10.4.2.6. Food Precautions
10.4.2.7. Sleep and Rest
10.4.2.8. Surgical Operations
10.5. Limitations and Type of Operation
10.5.1. Limitations of Flight Time
10.5.1.1. Activity Maximums

10.5.1.2. Excesses and Reduction of Rest Periods
10.5.1.3. Flight Records for Each Pilot
10.5.2. Types of Operation to Carry Out
10.5.2.1. List of activities
10.5.2.2. Description of Operations and Automatic Transfer Switchboard (ATS)
10.5.2.3. Necessary Skills and/or Authorizations
10.5.2.4. Personnel, Fleet and Equipment Required
10.6. Control and Supervision of the Operations
10.6.1. Accident Prevention Program and Flight Safety
10.6.2. Emergency Measures
10.6.3. Validity of Authorizations and Permissions
10.6.4. Pilot Requirement Compliance
10.6.5. Compliance with Mitigation Measures
10.6.6. The Aircraft
10.6.7. Operational Control
10.6.8. Authority Faculties
10.7. Procedures
10.7.1. Procedures
10.7.2. Monitoring of Air Operations
10.7.3. Completion of the Air Operation
10.8. Operational Aspects. Accidents and Incidents
10.8.1. Operational Aspects Related to the Type of Aircraft
10.8.2. Treatment, Notification and Report of Accidents, Incidents and Events
10.9. Security and Compliance With the Requirements
10.9.1. Security
10.9.1.1. Measures Adopted to Avoid Illicit Interference
10.9.1.2. Measures to Prevent Deliberate Interference with Aircraft System and Communication
10.9.2. Ensuring the Compliance With the Requirements for the Operation
10.9.2.1. Measures and Procedures to Verify Compliance with the Necessary Requirements
10.9.2.2. Measures and Procedures to Verify that Pilots Carry the Required Documentation for Operations

An intensive course that will enable you to increase your qualifications with the guarantees of a program that combines theoretical growth with contextual learning experiences"

06

Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.

TECH will prepare you to face new challenges in uncertain environments and achieve success in your career"

The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.
The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

"At TECH you will NOT have live classes (which you might not be able to attend)"

The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

> *TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want"*

Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.

Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

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

A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

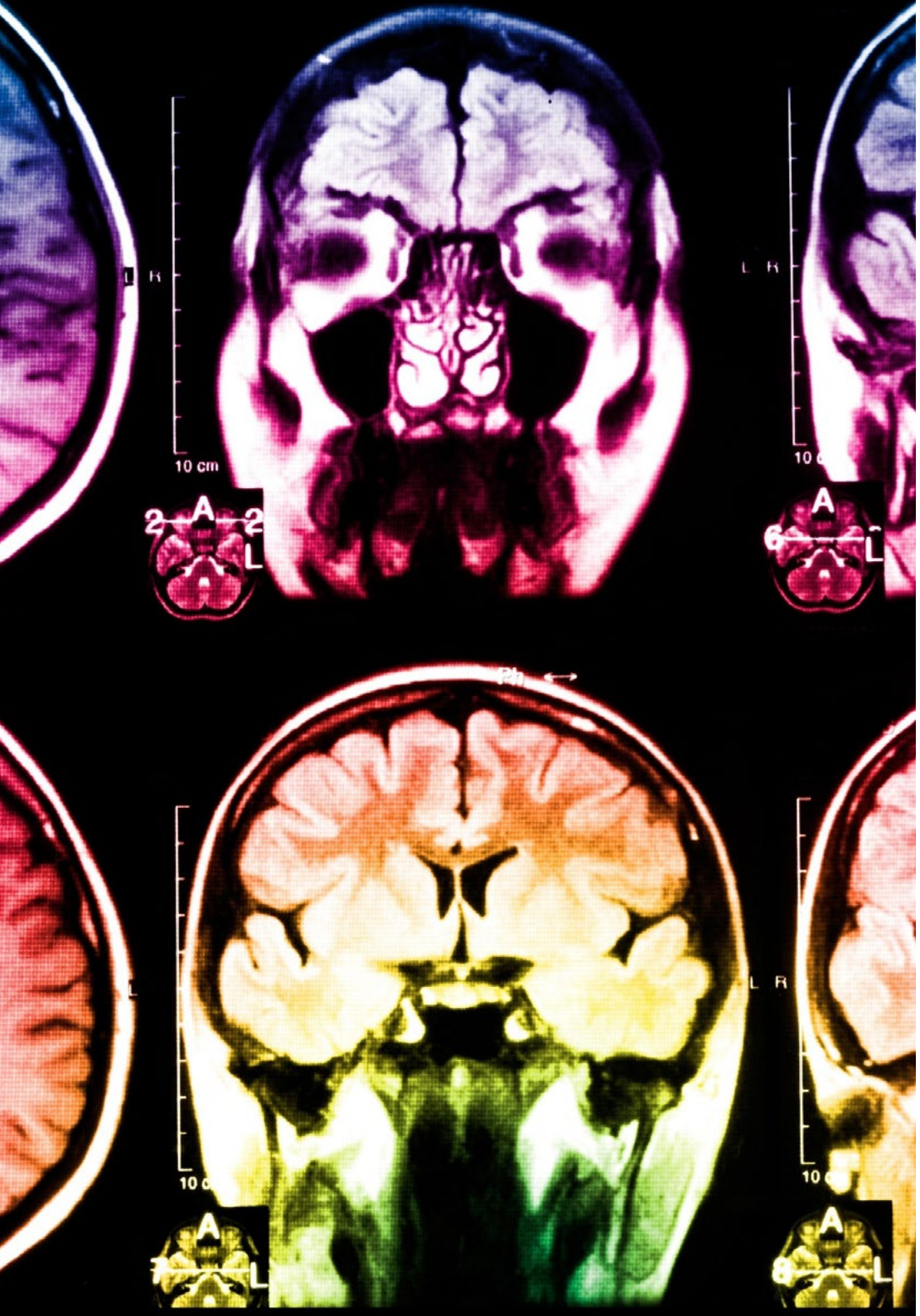
In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.

The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule"

The effectiveness of the method is justified by four fundamental achievements:

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.



The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the quality of teaching, quality of materials, course structure and objectives is excellent. Not surprisingly, the institution became the best rated university by its students on the Trustpilot review platform, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.

As such, the best educational materials, thoroughly prepared, will be available in this program:

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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.

Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.

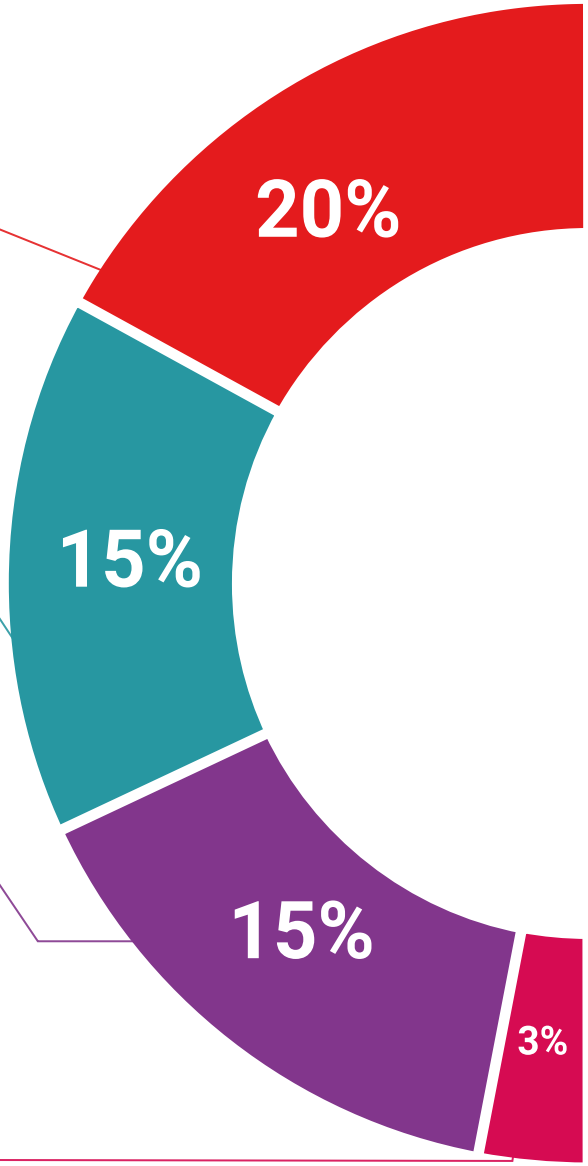
Interactive Summaries

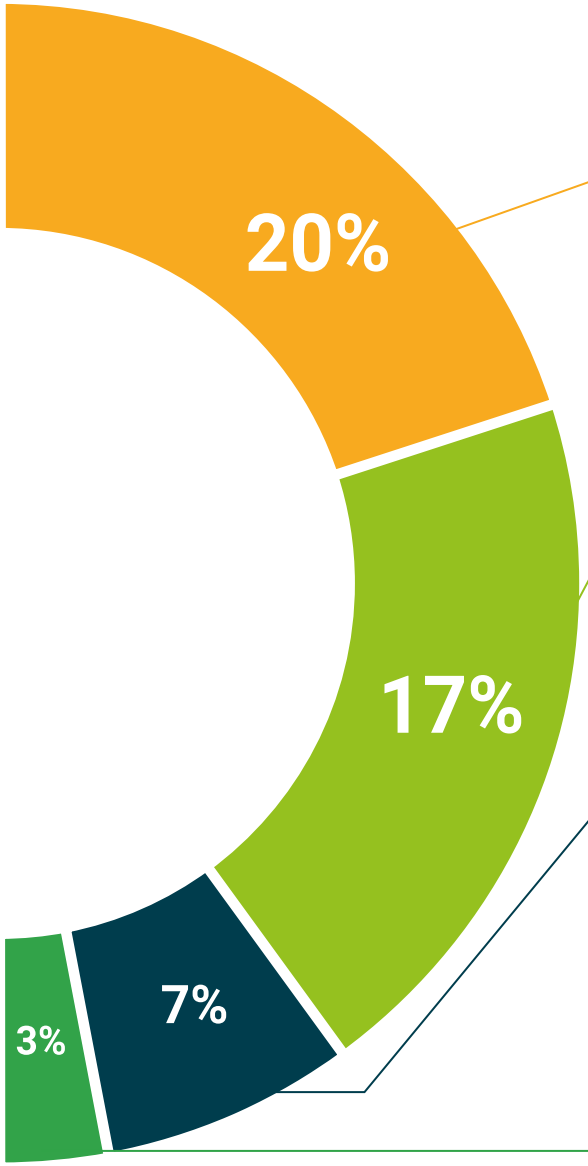
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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

Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.





Case Studies

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.

Testing & Retesting

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.

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 for future difficult decisions.

Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical and effective way to help students progress in their learning.

07

Certificate

The Professional Master's Degree in Drone Engineering and Operations guarantees students, in addition to the most rigorous and up-to-date education, access to a Professional Master's Degree issued by TECH Global University.

Include a Professional Master's Degree in Drone Engineering and Operations in your qualifications: A high-quality added value for any professional in the field of education"

This private qualification will allow you to obtain a**Professional Master's Degree diploma in Drone Engineering and Operations** 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** private qualification 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: **Professional Master's Degree in Drone Engineering and Operations**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**


tech global university

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

Professional Master's Degree in Drone Engineering and Operations

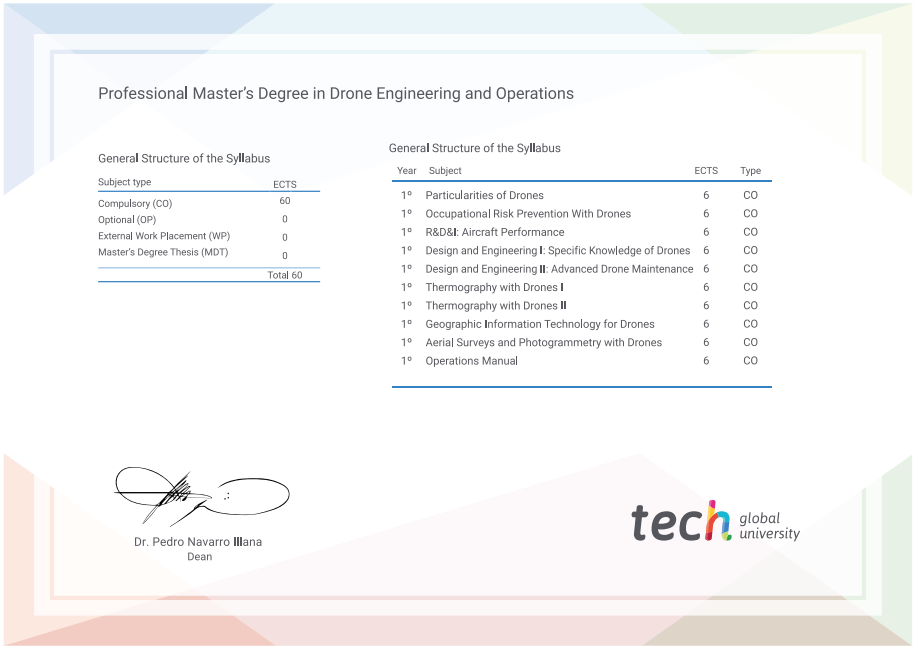
This is a private qualification of 1,800 hours of duration equivalent to 60 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

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
Dean

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


Professional Master's Degree in Drone Engineering and Operations

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 60

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Particularities of Drones	6	CO
1º	Occupational Risk Prevention With Drones	6	CO
1º	R&D&I: Aircraft Performance	6	CO
1º	Design and Engineering I: Specific Knowledge of Drones	6	CO
1º	Design and Engineering II: Advanced Drone Maintenance	6	CO
1º	Thermography with Drones I	6	CO
1º	Thermography with Drones II	6	CO
1º	Geographic Information Technology for Drones	6	CO
1º	Aerial Surveys and Photogrammetry with Drones	6	CO
1º	Operations Manual	6	CO

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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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Professional Master's Degree

Drone Engineering and Operations

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Accreditation: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Professional Master's Degree

Drone Engineering and Operations

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