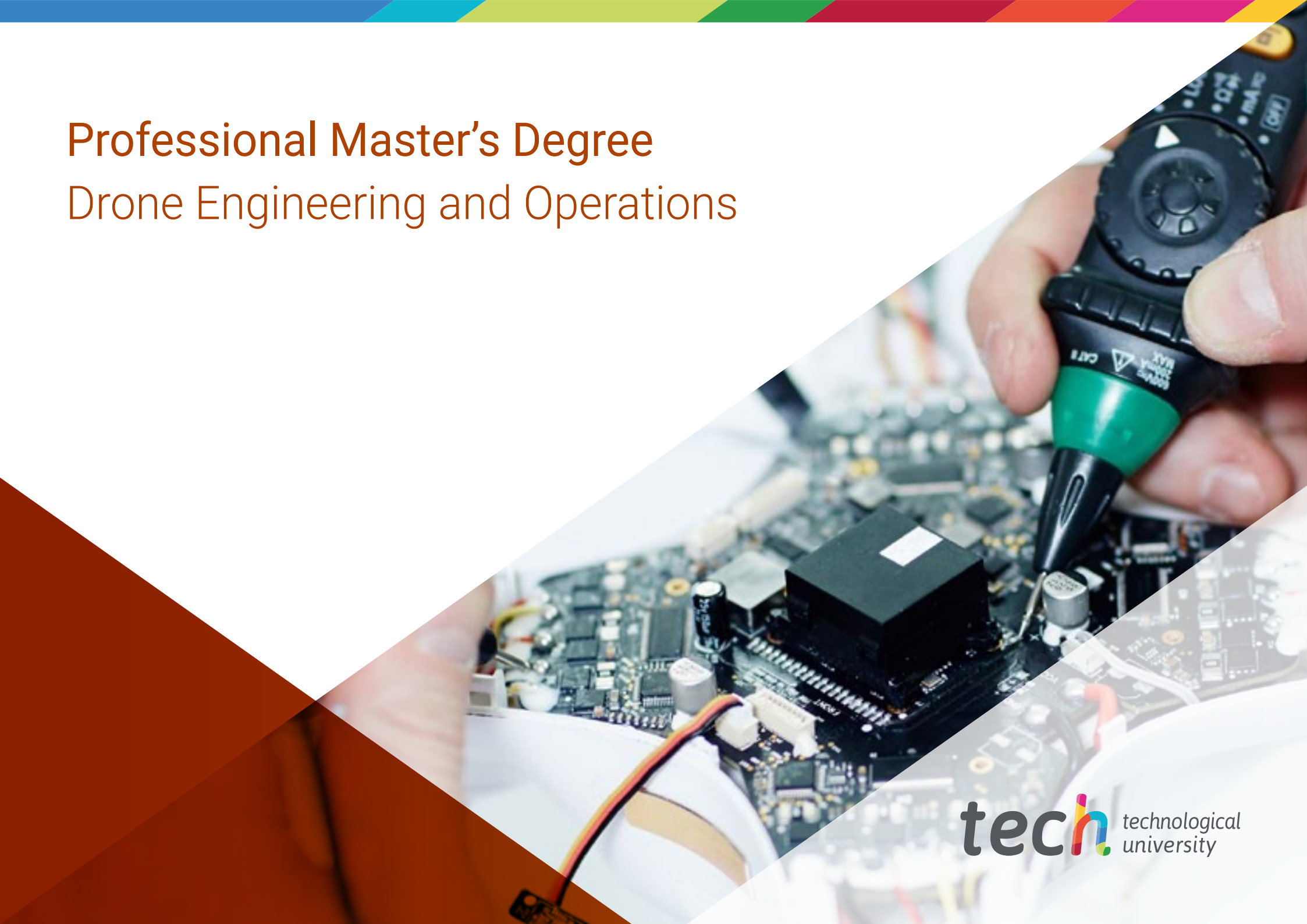
Professional Master's Degree

Drone Engineering and Operations



tech technological university

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Professional Master's Degree
Drone Engineering and Operations

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Technological University**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/in/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 train students to be successful in their profession.

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

The emergence of drones has changed the world of aeronautics. 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 training 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 of this Professional Master's Degree is for students to specialize their knowledge in simulated work environments and conditions in a rigorous and realistic manner so that they can later apply it in the real world.

Additionally, as it is a 100% online Professional Master's Degree, students are not constrained by fixed timetables or the need to commute to another physical location, rather, they can access the contents at any time of the day, balancing their professional or personal life with their studies.

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

- Practical cases presented by experts in Drone Engineering and Operations
- The graphic, schematic, and eminently practical contents with which they are created, provide scientific and practical information on the essential disciplines for professional practice
- Practical exercises where self-assessment can be used 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 train"

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, elaborated with the latest educational technology, will provide the professional with situated and contextual learning, that is to say, a simulated environment that will provide immersive specialization, programmed to train in real situations.

This program is designed around Problem Based Learning, whereby students must try to solve the different professional practice situations that arise during 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 Professional Master's Degree in Drone Engineering and Operations aims to train engineering professionals in the specific aspects involved in this field, offering them a high-impact specialization program to develop and apply the skills they require. A high-quality program that will optimize effort by converting it quickly into results.

The objective of this Professional Master's Degree is to train 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, checks, adjustments and substitution procedures in assemblies, elements, parts and indication systems to perform scheduled and corrective maintenance, both in an unmanned aerial platform and in the necessary accessory elements, such as ground stations, or accessories such as the payloads
- Select the procedures established in the maintenance manuals to store elements, parts and systems, including energy sources
- Apply the procedures established in maintenance manuals to perform weighing operations and aircraft payload calculations
- Analyze the management and organization models used in aeronautical maintenance
- Apply warehouse management techniques for stock control
- Perform the actions derived from the procedures established by the company to perform operations in manufacturing and assembly processes

- Evaluate situations of occupational risk prevention and environmental protection, proposing and applying individual and collective prevention and protection measures according to the applicable regulations in work processes, to ensure 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 operations aeronautical operators perform 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 the rights and duties of an active agent in society, taking into account the legal framework that regulates social and working conditions, in order to participate as a democratic citizen

Specific Objectives

Module 1. Specific Drone Features

- 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

- Detail the specific regulatory framework
- Delve into work hygiene and ergonomics
- Adapt personal equipment to the specific needs of each use
- Detail the procedures to be followed in case 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 essential features in unmanned aircrafts 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
- Delve into the most important items in aircraft maintenance to observe them and act in each scenario
- Acquire the necessary knowledge to act on the maintenance of unmanned aerial platforms depending on each MTOM
- Interpret the administrative registration models and fill them in according to current legislation
- Act according to good and respectful environmental practices

Module 6. Thermography with Drones I

- Access fundamental knowledge of thermography
- Apply and integrate drones to heat technology
- Select the camera according to usefulness and versatility
- Adapt infrared camera functionality to the proposed mission
- Process and analyze images to obtain final results
- Apply the acquired knowledge to different Transport Technology and Associated Services (TTAS)
- Visualize, edit and analyze the infrared 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 analyses 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 capabilities for informed diagnoses
- Detail and infer situations based on collected facts
- 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 measures

Module 8. Geographic Information Technology for Drones

- Implement technology for spatial data collection
- Manage spatial data, 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
- Make a practical analysis of exogenous conditions
- Identify and interpret the software options proposed for particular jobs
- Prepare a final result as a deliverable product

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

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 of the electric motor, ground station, chassis, landing gear systems, power supply systems, controller, variators and propellers, complying with specific aeronautical regulations
- Perform scheduled and corrective maintenance of hydraulic power, energy and pneumatic systems on the platform, 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 spare parts management in warehouses
- 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 the profession, bringing you closer to it in a realistic and direct way"

Management

Mr. Pliego Gallardo, Ángel Alberto

- Airline Transport Pilot ATPL (A)
- PPL (A), ULM, RPAS Pilot
- RPAS theoretical and practical instructor and examiner
- University Professor UNEATLANTICO
- University Diploma, Secretary of State for Universities and Research
- Professor of Aircraft Maintenance European Social Fund Course (TMVVO004PO) FEMPA Business School 2019
- EP Teacher, University of Alicante
- CAP in Technology, University of Alicante
- EASA Authorized Operator
- EASA Authorized RPAS Manufacturer

Mr. Bazán González, Gerardo

- Electronic Engineer
- Specialist in aerial works, Spain and Latin America
- Expert in Large Accounts and Institutional
- RPAS Pilot

Mr. Saiz Moro, Víctor

- Industrial Technical Engineer
- RPAS Pilot
- RPAS theoretical and practical instructor
- EASA Authorized Operator
- EASA Authorized RPAS Manufacturer
- Specialist and expert in aeronautical consultancy

Professors

Ms. López Amedo, Ana María

- Vice-president of the Aerial Sports Federation of the Valencian Community
- President of San Vicente del Raspeig Air Sports Club
- Expert in Institutional Aviation
- Specialist and expert in unmanned aviation
- RPAS Pilot
- RPAS Instructor
- RPAS Examiner

Mr. Fernández Moure, Rafael L.

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

Mr. Buades Blasco, Jerónimo

- Geographer
- Specialist in Information Systems and Environment
- CAP, 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. Specific Drone Features

1.1. Applicable Legislation
- 1.1.1. International Legislation
  - 1.1.1.1. International Civil Aviation Organization (ICAO)
  - 1.1.1.2. JARUS

1.2. The USA: The Paradigm
- 1.2.1. Requirements
- 1.2.2. Pilot Profiles
- 1.2.3. News in 2020: Low Altitude Authorization and Notification Capability (LAANC)

1.3. Europe
- 1.3.1. European Union Aviation Safety Agency (EASA): General Aspects
- 1.3.2. European Union Aviation Safety Agency (EASA): Features

1.4. Drones as Aeromodels
- 1.4.1. Flight Categories
  - 1.4.1.1. Recreational Flights
  - 1.4.1.2. Free Flights: F1
  - 1.4.1.3. Circular Flights: F2
  - 1.4.1.4. Radio-Controlled Flights F3
  - 1.4.1.5. Scale Models: F4
  - 1.4.1.6. Electric Engine Models F5
  - 1.4.1.7. Spatial Models S

1.5. Types of Aeromodels
- 15.1. Trainers
- 15.2. Acrobatic
- 15.3. FunFly
- 15.4. Models

1.6. Drones as Sport
- 1.6.1. FAI (World Air Sports Federation)
  - 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. At the International Level

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. Agricultural Applications

Module 2. Occupational Risk Prevention with Drones

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

2.2. Dangerous Goods Regulation (DGR)
- 2.2.1. Dangerous Goods
- 2.2.2. Classification and Action in Accidents and Incidents Involving Dangerous Goods

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

2.4. Personal Protective Equipment (PPE)
- 2.4.1. PPE
- 2.4.2. Use

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

2.6. Procedures in the Event of Industrial Accidents
- 2.6.1. Procedures in the Event of Industrial Accidents
- 2.6.2. Accident and Incident Investigations

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

2.8. Outdoor Work
- 2.8.1. Outdoor Work Hazards
- 2.8.2. Preventive Measures for Outdoor Work

2.9. Work with Drones
- 2.9.1. Outdoor Drone Work Hazards
- 2.9.2. Preventive Measures for Drone Work

Module 3. R&D&I: Aircraft Performance

3.1. Fixed-Wing Aircrafts I
  3.1.1. Energies Acting on the Aircraft
  3.1.2. Forces Acting on the Aircraft
3.2. Fixed-Wing Aircrafts II
  3.2.1. Glide ratio
  3.2.2. Stability: Aircraft Axes
  3.2.3. Center of Gravity and Center of Pressures
  3.2.4. Stall and Auger
3.3. Rotary-Wing Aircrafts I
  3.3.1. Energies Acting on the Aircraft
  3.3.2. Forces Acting on the Aircraft
3.4. Rotary-Wing Aircrafts II
  3.4.1. Rotor Systems
  3.4.2. Induced Oscillations:
    3.4.2.1. Pilot-Induced Oscillation (PIO)
    3.4.2.2. Mass-Induced Oscillation (MIO)
    3.4.2.3. Aircraft-Induced Oscillation (AIO)
3.5. RPAS Flying Methodology
  3.5.1. Preflight: Safety Checklist
  3.5.2. Take Off and Ascent
  3.5.3. Cruise
  3.5.4. Descent and Landing
  3.5.5. After Landing
3.6. Flight Profiles and Operation Features
  3.6.1. Object
  3.6.2. Operation Features
  3.6.3. Flight Preparation: What Does it Involve?
  3.6.4. Normal Operation
  3.6.5. Situations Arising from Abnormal and Emergency Situations
  3.6.6. Flight Operations Analysis and Closure
  3.6.7. Methodology to Elaborate Flight Profiles
3.7. Flight Planning: Risk Assessment
  3.7.1. Risk factors
  3.7.2. Implementation
3.8. Methodology to Elaborate Emergency Alert Systems (EAS) for Declarative Operations I
  3.8.1. General Methodology
3.9. Methodology to Elaborate EAS for Declarative Operations II
  3.9.1. SORA Methodology

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

4.1. Aircraft Classification for Pilots and Engineers
  4.1.1. Generic
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. 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. Registration: Registration, Types and Special Certificates
  4.3.3. Requirements
4.4. Design and Engineering: Aircraft Characterization
  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. Purpose, Scope and Applicable Regulations
  4.5.2. Contents
4.6. Aircraft Component Design and Engineering Tools
  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 Check
- 4.8.2. Periodic Checks

4.9. Basic Aircraft and Ground Station Maintenance for Pilots and Engineers
- 4.9.1. Preflight
- 4.9.2. Postflight

4.10. Use of Lithium Polymer Batteries
- 4.10.1. Charging, Use and Storage
- 4.10.2. Basic Calculation of Battery 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 Stops due to Mechanical Failures
  - 5.1.2.2. Avoid Malfunctions 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. Company Cost Reduction
  - 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. Implementation and Management
  - 5.2.1.5. Coordination
- 5.2.2. Typology
  - 5.2.2.1. Classification
  - 5.2.2.2. Preventive 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. Program
- 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. Maintenance Process Control
- 5.5.4. Elements Related to the Concept of Control
- 5.5.5. Requirements for Proper Control
- 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 Organizations

5.6. Aircraft and Equipment Ground Operations
- 5.6.1. Assembly and Calibration Forecast
- 5.6.2. Start-Up: Pre, In and Postflight

5.7. Technological Aircraft Facilities for Engineers

5.7.1. Mechanics
5.7.2. Hydraulics
5.7.3. Pneumatics
5.8. Electrical Installation for Engineers
5.8.1. Definition
5.8.2. Technology: Drone Taxonomy
5.8.3. Electronics
5.9. Technical Documentation 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. Heat Transfer
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 Cameras
6.4.2. Image
6.5. Thermal Cameras
6.5.1. Functioning and Features
6.5.2. Main Cameras on the Market
6.6. Applications in Thermal Imaging Engineering
6.6.1. Construction and Industry
6.6.2. Agriculture and Livestock
6.6.3. Emergencies
6.7. Thermal Imaging
6.7.1. Imaging
6.7.2. Calibration
6.8. Processing Thermal Data
6.8.1. Preliminary Processing
6.8.2. Image Analysis
6.9. Visualization, Editing and Analysis Software
6.9.1. FLIR Tools
6.9.2. Program Operation
6.10. Most Frequent Errors
6.10.1. Imaging
6.10.2. Image Interpretation

Module 7. Thermography with Drones II

7.1. Applied Theory
7.1.1. The Black Body and the Hot Spot
7.1.2. Radiation Theories
7.2. Infrared Thermography II
7.2.1. Active and Passive Thermography
7.2.2. The Thermogram
7.2.3. Application Conditions
7.3. Causes and Effects of Measurement
7.3.1. Physical Laws and Principles
7.3.2. The Measured Object: Factors
7.4. Temperature and Distortions
7.4.1. Measurement 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 Missions: Wind Farms and Solar Plants
7.6.2. Dynamic Mission: Surveillance and Security
7.7. Social Applications
7.7.1. Fire Fighting
7.7.2. Rescue and Emergency Situations
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. Deliverable Reports
7.10.1. Equipment and Criteria
7.10.2. Example Report

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: Implementing Spatial Data
8.2.1. Physical Hardware Resources Applied to Work with RPAS
8.2.2. Logical Software Resources for Data Processing
8.3. The Quality of Spatial Data: Data Sources and Resources
8.3.1. Notions on Spatial Data
8.3.2. Spatial Data Infrastructure (SDI)
8.4. 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. Applying GPS and GIS to Produce Spatial Data
8.6.1. Spatial Database Management
8.6.2. Interoperability between Data Management Devices
8.7. Practical Applications for Property Development and Management
8.7.1. Real Estate Registry
8.8. Practical Applications for Land Use Planning and Management
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)
8.9. Protected Natural Spaces
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. Project Planning Techniques and Methods

Module 9. Aerial Surveys and Photogrammetry with Drones

9.1. Fundamental Principles of Photogrammetry
9.1.1. Objectives of Photogrammetry and Aerial Surveys
9.1.2. Photogrammetry with Drones
9.1.3. Applications 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, Light, Precision
9.2.2. Creating Digitized Models
9.2.3. Three Fundamental Axes 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. Electronic Shutter

9.3. Photogrammetry with Drones
- 9.3.1. Fundamental Concepts of Quality, Precision and Geographic Accuracy
- 9.3.2. Developing Aerial Surveys
  - 9.3.2.1. Image Surveys
    - 9.3.2.1.1. Height
    - 9.3.2.1.2. Image Overlapping
    - 9.3.2.1.3. Airspeed
    - 9.3.2.1.4. Aircraft Direction and Orientation

9.4. Using Ground Control Points
- 9.4.1. Objective for Ground Control Point Placement
- 9.4.2. Universal Transverse Mercator (UTM) Zones
- 9.4.3. Measuring Ground Control Points
- 9.4.4. Organizing and Distributing Control Points
- 9.4.5. Types of Visual Control Point Targets and Recommendations

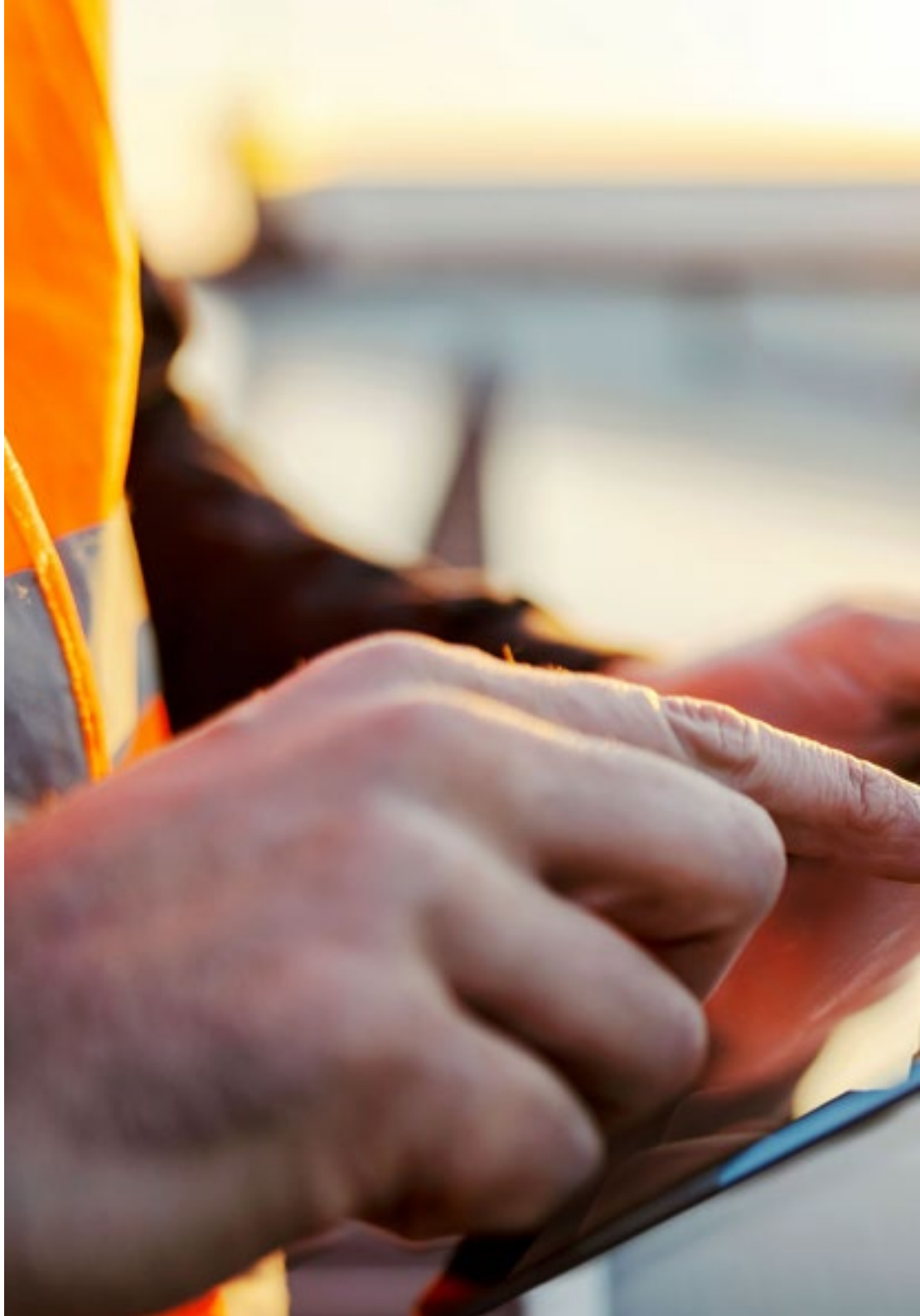
9.5. Drones and Recommended Equipment for Aerial Photogrammetric Surveys
- 9.5.1. Configuring Flight Parameters
- 9.5.2. Camera Configuration

9.6. Practical Survey
- 9.6.1. Weather Conditions for Surveys
- 9.6.2. Land Analysis
- 9.6.3. Extension and Area to be Covered
- 9.6.4. Light and Shadow Management

9.7. Image Capturing and Autonomous Flight Software (DroneDeploy)
- 9.7.1. Parameters to Be Established
- 9.7.2. Creating Autonomous Missions
- 9.7.3. Data Mining and Warehousing

9.8. Drone Flight and Data Collection
- 9.8.1. Safety and Preflight Checks
- 9.8.2. Importing Missions
- 9.8.3. Model Enrichment

9.9. DroneDeploy Data Processing
- 9.9.1. Data Review
- 9.9.2. Importing Images



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

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

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

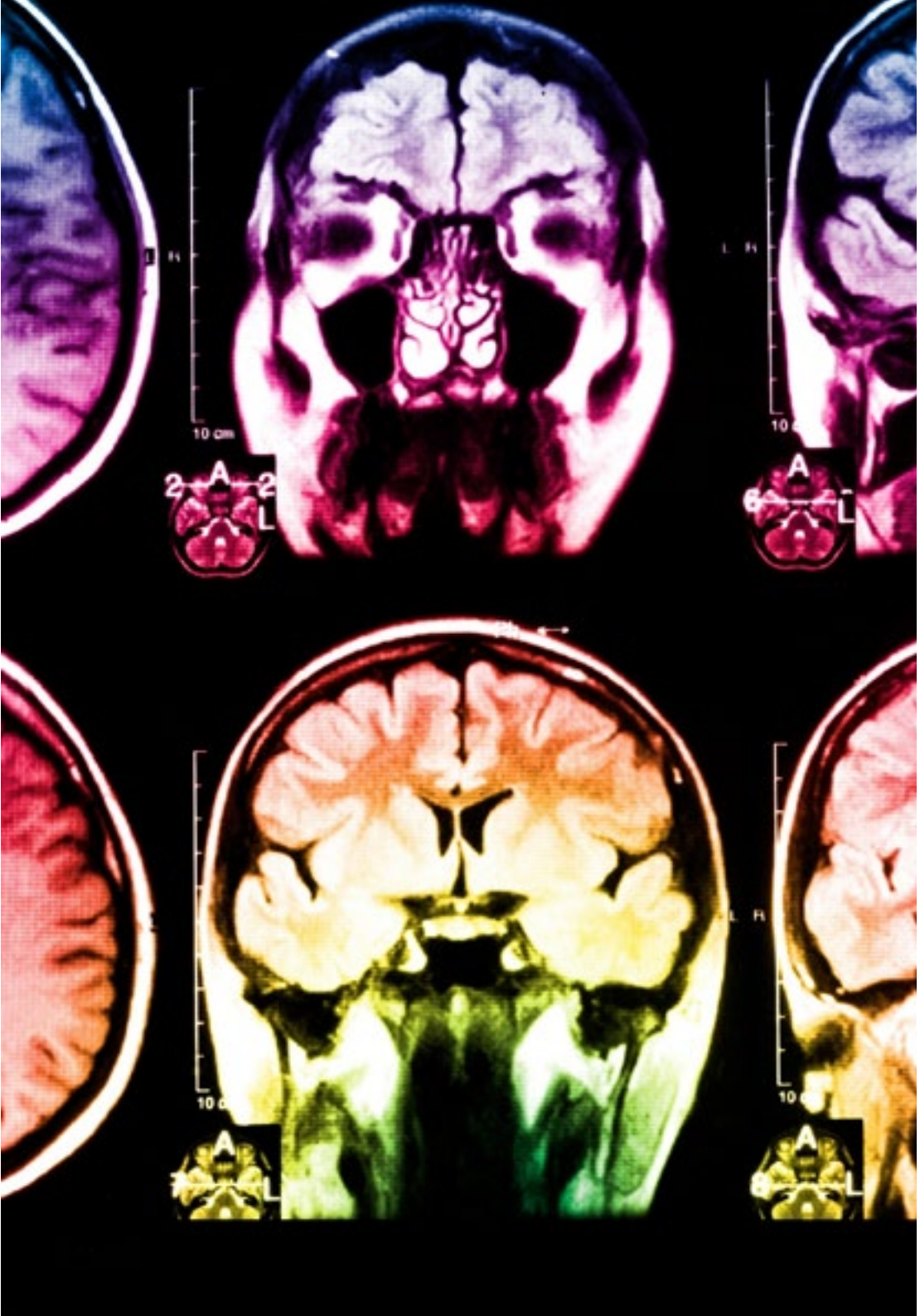
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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 relearn). 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 elearning, 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.

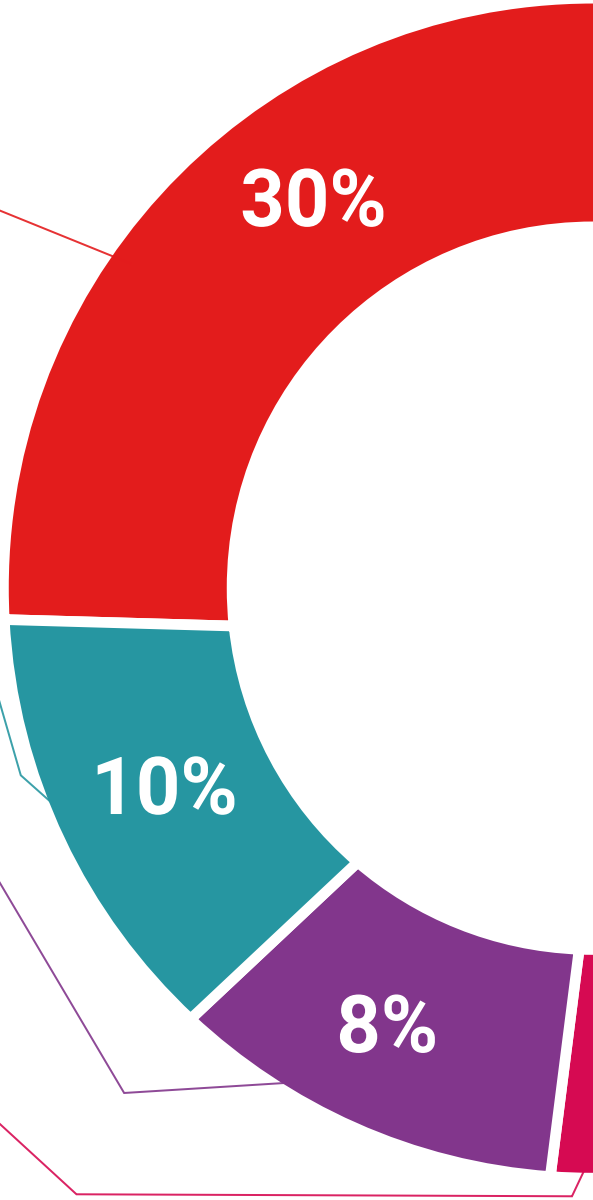
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

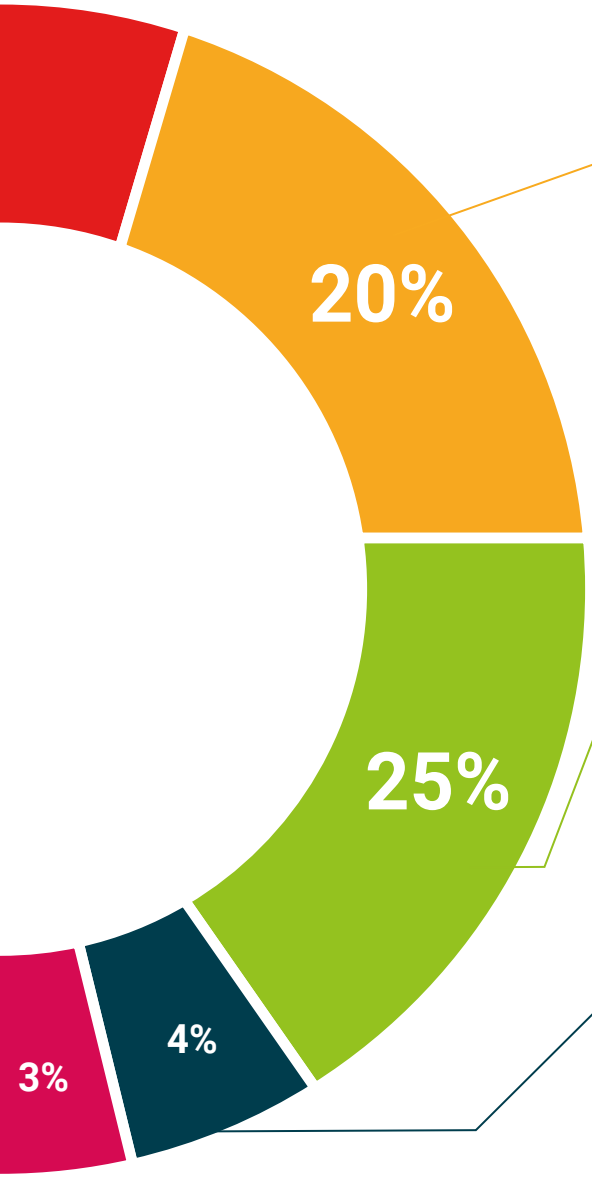
Practising Skills and Abilities

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 Professional Master's Degree in Drone Engineering and Operations guarantees you, in addition to the most rigorous and updated training, access to a Professional Master's Degree issued by TECH Technological University.

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

This **Professional Master's Degree in Drone Engineering and Operations** contains the most complete and up-to-dated program on the market.

After the student has passed the assessments, they will receive their corresponding **Professional Master's Degree** issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Professional Master's Degree, and meets the requirements commonly demanded by job exchanges, competitive examinations and professional career evaluation committees.

Title: **Professional Master's Degree in Drone Engineering and Operations**

Official Nº of hours: **1,500 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having successfully passed and accredited the following program

PROFESSIONAL MASTER'S DEGREE

in

Drone Engineering and Operations

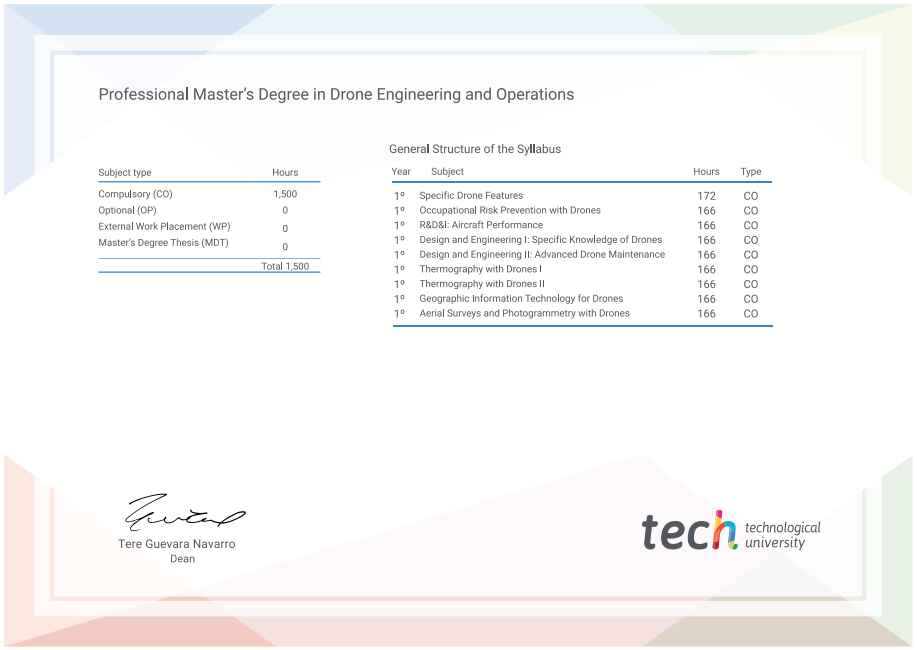
This is a qualification awarded by this University, equivalent to 1,500 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
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

Subject type	Hours
Compulsory (CO)	1,500
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 1,500

General Structure of the Syllabus

Year	Subject	Hours	Type
1º	Specific Drone Features	172	CO
1º	Occupational Risk Prevention with Drones	166	CO
1º	R&D&I: Aircraft Performance	166	CO
1º	Design and Engineering I: Specific Knowledge of Drones	166	CO
1º	Design and Engineering II: Advanced Drone Maintenance	166	CO
1º	Thermography with Drones I	166	CO
1º	Thermography with Drones II	166	CO
1º	Geographic Information Technology for Drones	166	CO
1º	Aerial Surveys and Photogrammetry with Drones	166	CO

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Dean

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*Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH EDUCATION 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 Technological University**
- Schedule: **at your own pace**
- Exams: **online**

Professional Master's Degree

Drone Engineering and Operations

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