Postgraduate Diploma
Specialized Aerial Operations

tech technological university

tech technological university

Postgraduate Diploma
Specialized Aerial Operations

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

Website: **www.techtitute.com/in/engineering/postgraduate-diploma/postgraduate-diploma-specialized-aerial-operations**

Index

01

Introduction

The application of drones to engineering cannot ignore the approach to photogrammetry from a specialized point of view. By completing this program, students will learn the thermography operations to be performed, applying it to various circumstances that must be informed by engineering.

A unique opportunity to acquire in depth knowledge and stand out in what will be a highly demanded profession of the future.

If you are looking for quality training that will help you specialize in one of the fields with the most professional prospects, this is your best option"

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

Another very important aspect is that of pilot training. 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 Specialized Aerial Operations. The main objective of this Postgraduate Diploma 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 Postgraduate Diploma, 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 **Postgraduate Diploma in Specialized Aerial 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 Specialized Aerial Operations
- The graphic, schematic, and eminently practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self assessment can be used to improve learning
- Special emphasis on innovative methodologies in Specialized Aerial 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

Do not miss the opportunity to study this Postgraduate Diploma in Specialized Aerial Operations at TECH. It's the perfect opportunity to advance your career”

This course is the best investment you can make when choosing a refresher program to update your existing knowledge of Specialized Aerial Operations"

This program comes with the best educational material, providing you with a contextual approach that will facilitate your learning.

This 100% online Postgraduate Diploma will allow you to balance your professional life with your studies. You choose where and when to train.

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

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive training programmed to train 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 during the academic year. For this, the professional will be assisted by an innovative, interactive video system made by recognized and extensively experienced experts in Specialized Aerial Operations.

02

Objectives

The Postgraduate Diploma in Specialized Aerial Operations is designed to facilitate professional performance in the field to acquire knowledge of the main developments in the sector.

Our goal is to make you the best professional in your sector. And for this we have the best methodology and content"

General Objectives

- Specify and establish a joint vision of unmanned aviation in the world and, more specifically, in Europe and the USA
- 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"
- Detail the use and application of drones in technological engineering activities as specified in the RD 1036 (Royal Decree 1036/2017)
- 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. 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 of 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 2. 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 3. 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

Module 4. Operations Manual

- Know the inner workings of unmanned Aerial Companies in depth
- Understand the relationship between drone operators the competent authorities in depth
- 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 establishment of necessary constraints
- Identify and assess potential risks
- Detail methodologies for the proper maintenance of Unmanned Aircraft Systems (UAS)
- Delve into how to conduct safe air operations
- Develop the capabilities, skills and competences to implement operator configurations under safety standards

A path to achieve training and professional growth that will propel you towards a greater level of competitiveness in the employment market"

03

Course Management

In keeping with the total quality standard of this Postgraduate Diploma, TECH is proud to provide students with a teaching staff of the highest level, chosen 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.

Our university employs the best professionals in all areas who share their knowledge to help you"

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 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

04

Structure and Content

The content structure has been designed by the best professionals in the IT engineering sector, with extensive experience and recognized prestige in the profession.

We have the most complete and up to date academic program in the market. We strive for excellence and for you to achieve it too"

Module 1. Thermography with Drones I

1.1. Thermography and Drones
- 1.1.1. Definitions
- 1.1.2. Background

1.2. Physical Basics of Infrared Thermography
- 1.2.1. Heat Transfer
- 1.2.2. Electromagnetic Radiation

1.3. Application in RPAS
- 1.3.1. Typology
- 1.3.2. RPAS Components

1.4. Integration in Unmanned Aerial Platforms
- 1.4.1. Choice of Cameras
- 1.4.2. Image

1.5. Thermal Cameras
- 1.5.1. Functioning and Features
- 1.5.2. Main Cameras on the Market

1.6. Applications in Thermal Imaging Engineering
- 1.6.1. Construction and Industry
- 1.6.2. Agriculture and Livestock
- 1.6.3. Emergencies

1.7. Thermal Imaging
- 1.7.1. Imaging
- 1.7.2. Calibration

1.8. Processing Thermal Data
- 1.8.1. Preliminary Processing
- 1.8.2. Image Analysis

1.9. Visualization, Editing and Analysis Software
- 1.9.1. *FLIR Tools*
- 1.9.2. Program Operation

1.10. Most Frequent Errors
- 1.10.1. Imaging
- 1.10.2. Image Interpretation

Module 2. Thermography with Drones II

2.1. Applied Theory
- 2.1.1. The Black Body and the Hot Spot
- 2.1.2. Radiation Theories

2.2. Infrared Thermography II
- 2.2.1. Active and Passive Thermography
- 2.2.2. The Thermogram
- 2.2.3. Application Conditions

2.3. Causes and Effects of Measurement
- 2.3.1. Physical Laws and Principles
- 2.3.2. The Measured Object: Factors

2.4. Temperature and Distortions
- 2.4.1. Measurement Systems and Units
- 2.4.2. Distortions

2.5. Software and Hardware
- 2.5.1. Software
- 2.5.2. Hardware

2.6. Missions
- 2.6.1. Static Missions: Wind Farms and Solar Plants
- 2.6.2. Dynamic Mission: Surveillance and Security

2.7. Social Applications
- 2.7.1. Fire Fighting
- 2.7.2. Rescue and Emergency Situations

2.8. Analysis and Diagnosis
- 2.8.1. Interpretive Analysis and Diagnosis
- 2.8.2. Functional Analysis and Diagnosis

2.9. Reports
- 2.9.1. Thermal Reports
- 2.9.2. Field Analysis

2.10. Deliverable Reports
- 2.10.1. Equipment and Criteria
- 2.10.2. Example Report

Module 3. Aerial Surveys and Photogrammetry with Drones

3.1. Fundamental Principles of Photogrammetry
- 3.1.1. Objectives of Photogrammetry and Aerial Surveys
- 3.1.2. Photogrammetry with Drones
- 3.1.3. Applications of Photogrammetry with Drones
- 3.1.4. Aerial Survey Results: Orthomaps, Digital Surface Models, 3D Models, and Point Clouds

3.2. Photography Concepts Applicable to Photogrammetry with Drones
- 3.2.1. General Photography: Focus, Light, Precision
- 3.2.2. Creating Digitized Models
- 3.2.3. Three Fundamental Axes for Quality Surveys
  - 3.2.3.1. Focal Length
  - 3.2.3.2. Flight Altitude
  - 3.2.3.3. Sensor Size
- 3.3.4. Mechanical Shutter vs. Electronic Shutter

3.3. Photogrammetry with Drones
- 3.3.1. Fundamental Concepts of Quality, Precision and Geographic Accuracy
- 3.3.2. Developing Aerial Surveys
  - 3.3.2.1. Image Surveys
    - 3.3.2.1.1. Height
    - 3.3.2.1.2. Image Overlapping
    - 3.3.2.1.3. Airspeed
    - 3.3.2.1.4. Aircraft Direction and Orientation

3.4. Using Ground Control Points
- 3.4.1. Objective for Ground Control Point Placement
- 3.4.2. Universal Transverse Mercator (UTM) Zones
- 3.4.3. Measuring Ground Control Points
- 3.4.4. Organizing and Distributing Control Points
- 3.4.5. Types of Visual Control Point Targets and Recommendations

3.5. Drones and Recommended Equipment for Aerial Photogrammetric Surveys
  3.5.1. Configuring Flight Parameters
  3.5.2. Camera Configuration
3.6. Practical Survey
  3.6.1. Weather Conditions for Surveys
  3.6.2. Land Analysis
  3.6.3. Extension and Area to be Covered
  3.6.4. Light and Shadow Management
3.7. Image Capturing and Autonomous Flight Software (DroneDeploy)
  3.7.1. Parameters to Be Established
  3.7.2. Creating Autonomous Missions
  3.7.3. Data Mining and Warehousing
3.8. Drone Flight and Data Collection
  3.8.1. Safety and Preflight Checks
  3.8.2. Importing Missions
  3.8.3. Model Enrichment
3.9. DroneDeploy Data Processing
  3.9.1. Data Review
  3.9.2. Importing Images
3.10. Deliverables
  3.10.1. Orthomaps
  3.10.2. Point Cloud
  3.10.3. Digital Models and Contour Lines
  3.10.4. Volumetric Measurement

Module 4. Operations Manual

4.1. Definition, Cover and Table of Contents
4.2. Revision Log
  4.2.1. List of Effective Pages
4.3. Introduction
  4.3.1. Responsible Declaration
  4.3.2. Purpose and Scope
  4.3.3. Definitions
  4.3.4. Applicable Regulations
4.4. Administration and Control: Organization and Responsibilities
  4.4.1. MO Management and Control
    4.4.1.1. Amendments and Revisions
    4.4.1.2. Documentary Control
    4.4.1.3. Document Distribution and Control Manager
  4.4.2. Organization and Responsibilities
    4.4.2.1. Authorized Pilots
    4.4.2.2. Organizational Structure
    4.4.2.3. Management Personnel Responsibilities and Functions
    4.4.2.4. Roles and Responsibilities of the Members within the Organization:
4.5. Requirements and Precautions
  4.5.1. Qualification and Training Requirements
    4.5.1.1. Piloting Requirements
    4.5.1.2. Previous Training and Experience
    4.5.1.3. Training Program
    4.5.1.4. Recurrent Education and Training Records
    4.5.1.5. Aircraft Maintenance

4.5.2. Precautions for Crew Health
4.5.2.1. Precautions for Environmental Conditions in the Operation Zone
4.5.2.2. Alcohol Intake
4.5.2.3. Narcotics
4.5.2.4. Immunization
4.5.2.5. Blood Donation
4.5.2.6. Dietary Precautions
4.5.2.7. Sleep and Rest
4.5.2.8. Surgical Operations
4.6. Limitations and Types of Operations
4.6.1. Flight Time Limitations
4.6.1.1. Activity Maximums
4.6.1.2. Excessive and Reduced Rest Times
4.6.1.3. Individual Pilot Flight Logs
4.6.2. Types of Operations to Be Performed
4.6.2.1. List of Activities
4.6.2.2. Description of Operations and Automatic Transfer Switchboard (ATS)
4.6.2.3. Necessary Clearances and/or Authorizations
4.6.2.4. Personnel, Fleet and Equipment Required
4.7. Operations Control and Supervision
4.7.1. Accident Prevention and Flight Safety Program
4.7.2. Emergency Measures
4.7.3. Authorization and Permit Validity
4.7.4. Pilot Requirement Compliance
4.7.5. Mitigation Measures Compliance
4.7.6. Aircrafts
4.7.7. Operational Control
4.7.8. Regulatory Authority Powers

4.8. Ultrasound-Guided
4.8.1. Flight Preparation
4.8.2. Air Operation Monitoring
4.8.3. Air Operation Completion
4.9. Operational Aspects: Accidents and Incidents
4.9.1. Operational Aspects Related to Aircraft Type
4.9.2. Accidents, Incidents and Events Management, Notification and Reporting
4.10. *Security* and Requirement Compliance
4.10.1. *Security*
4.10.1.1. Measures to Prevent Unlawful Interference
4.10.1.2. Measures to Prevent Deliberate Interference with Aircraft System and Communication
4.10.2. Ensuring Compliance with Operation Requirements
4.10.2.1. Measures and Procedures to Verify Compliance with the Necessary Requirements
4.10.2.2. Measures and Procedures to Verify that Pilots Carry the Required Documentation for Operations

This program will allow you to advance in your career comfortably"

05

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

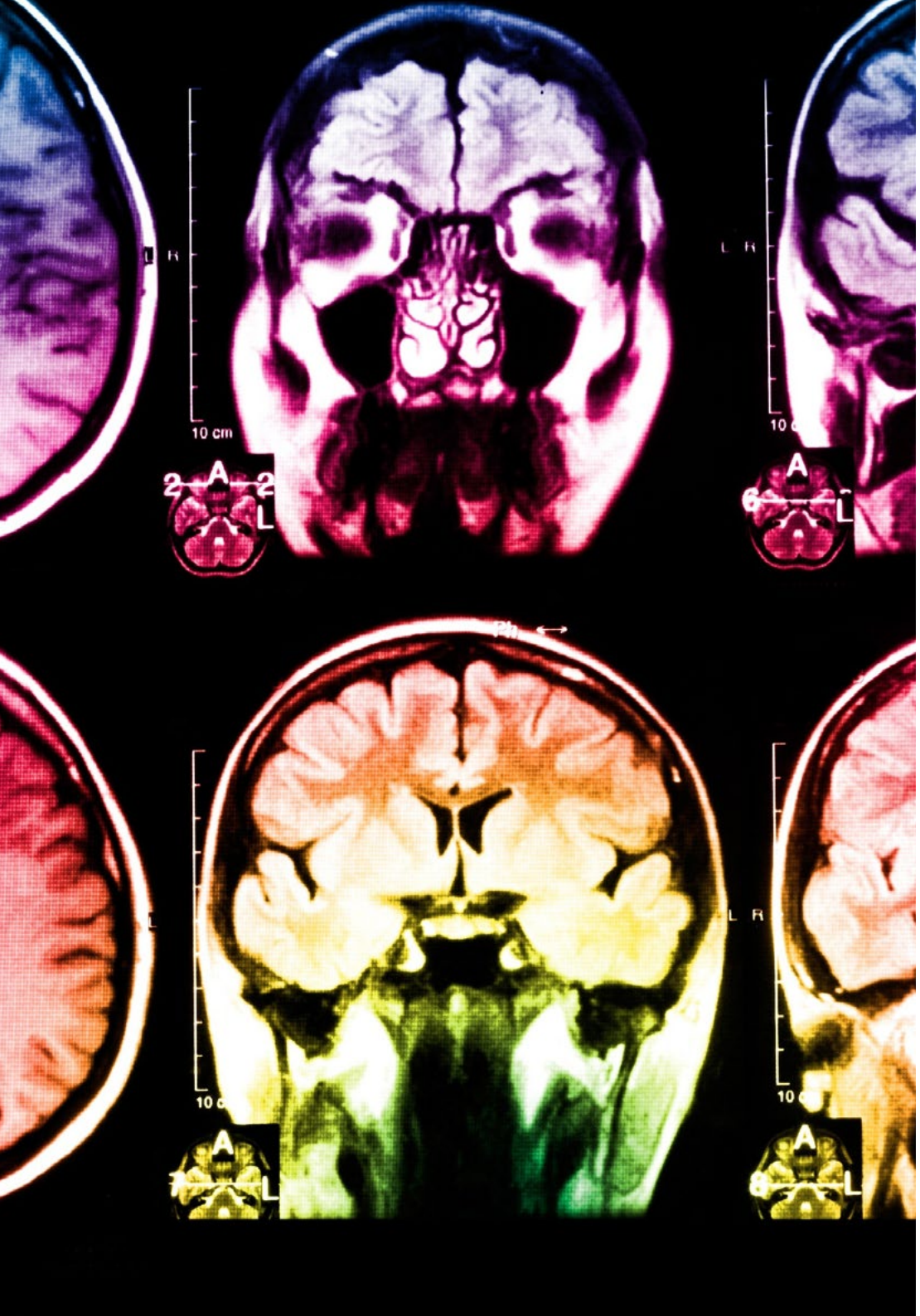
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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.

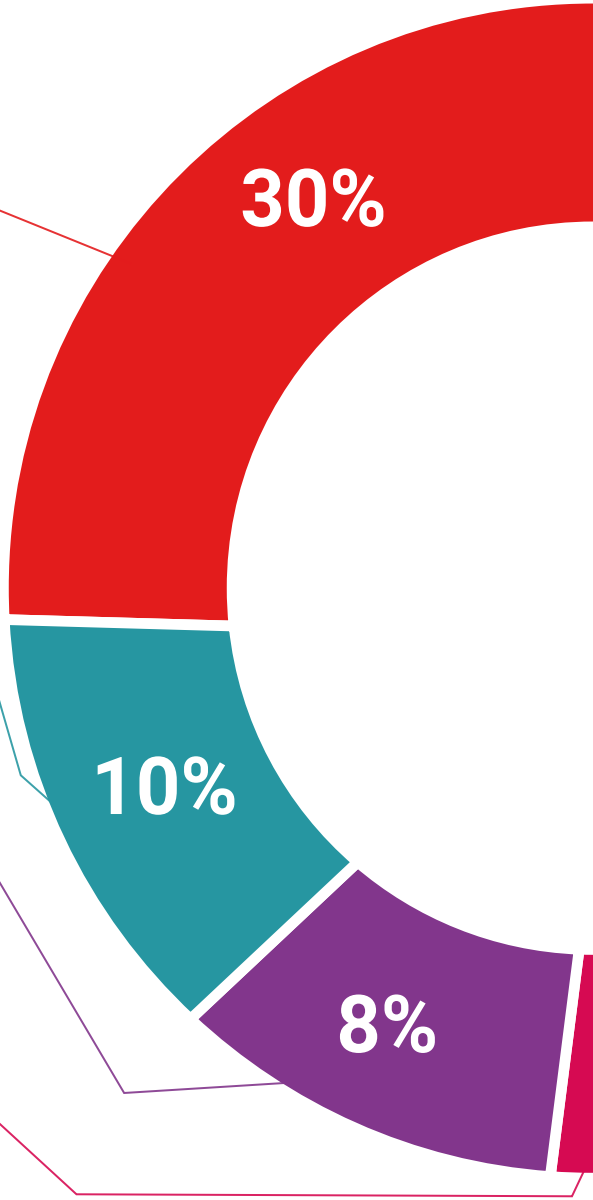
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

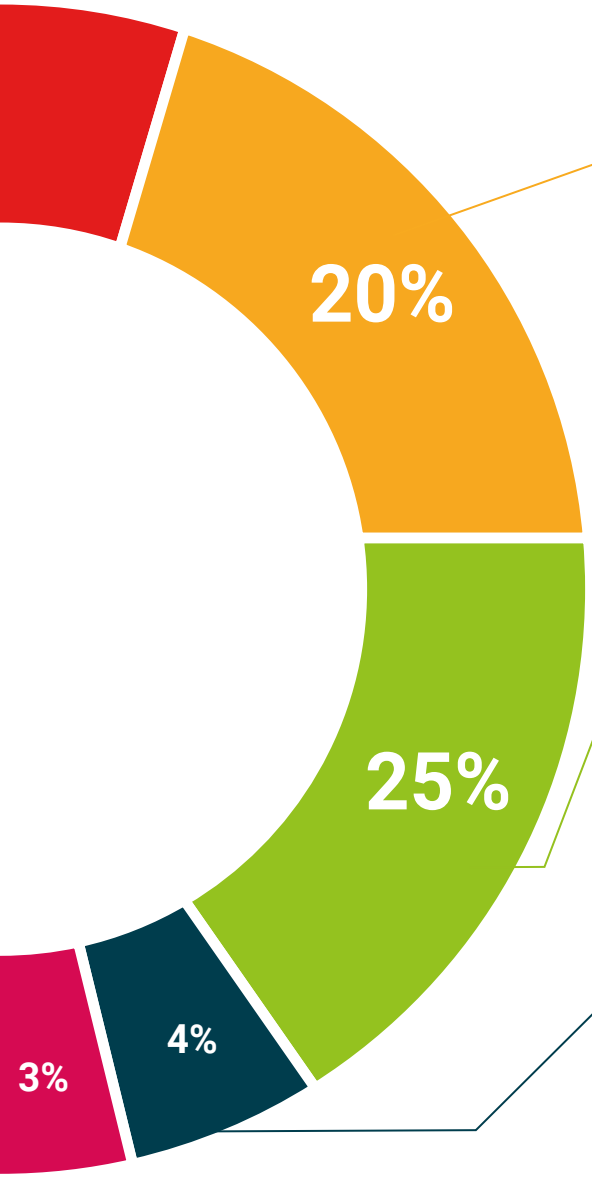
Practising Skills and Abilities

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.

06

Certificate

The Postgraduate Diploma in Specialized Aerial Operations guarantees students, in addition to the most rigorous and up to date education, access to a Postgraduate Diploma issued by TECH Technological University.

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"

This **Postgraduate Diploma in Specialized Aerial Operations** contains the most complete and up to date program the market.

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

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

Title: **Postgraduate Diploma in Specialized Aerial Operations**
Official Nº of hours: **600 h.**


tech technological university

Awards the following

CERTIFICATE

to

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

For having passed and accredited the following program

POSTGRADUATE DIPLOMA

in

Specialized Aerial Operations

This is a qualification awarded by this University, equivalent to 600 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

*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.

tech technological university

Postgraduate Diploma
Specialized Aerial Operations

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

Postgraduate Diploma
Specialized Aerial Operations

tech technological university