



# Postgraduate Diploma Applications of Artificial Intelligence, IoT, and Medical Devices in Telemedicine

» Modality: online

» Duration: 6 months

» Certificate: TECH Technological University

» Dedication: 16h/week

» Schedule: at your own pace

» Exams: online

Website: www.techtitute.com/us/artificial-intelligence/postgradate-diploma/postgraduate-diploma-applications-artificial-intelligence-iot-medical-devices-telemedicine

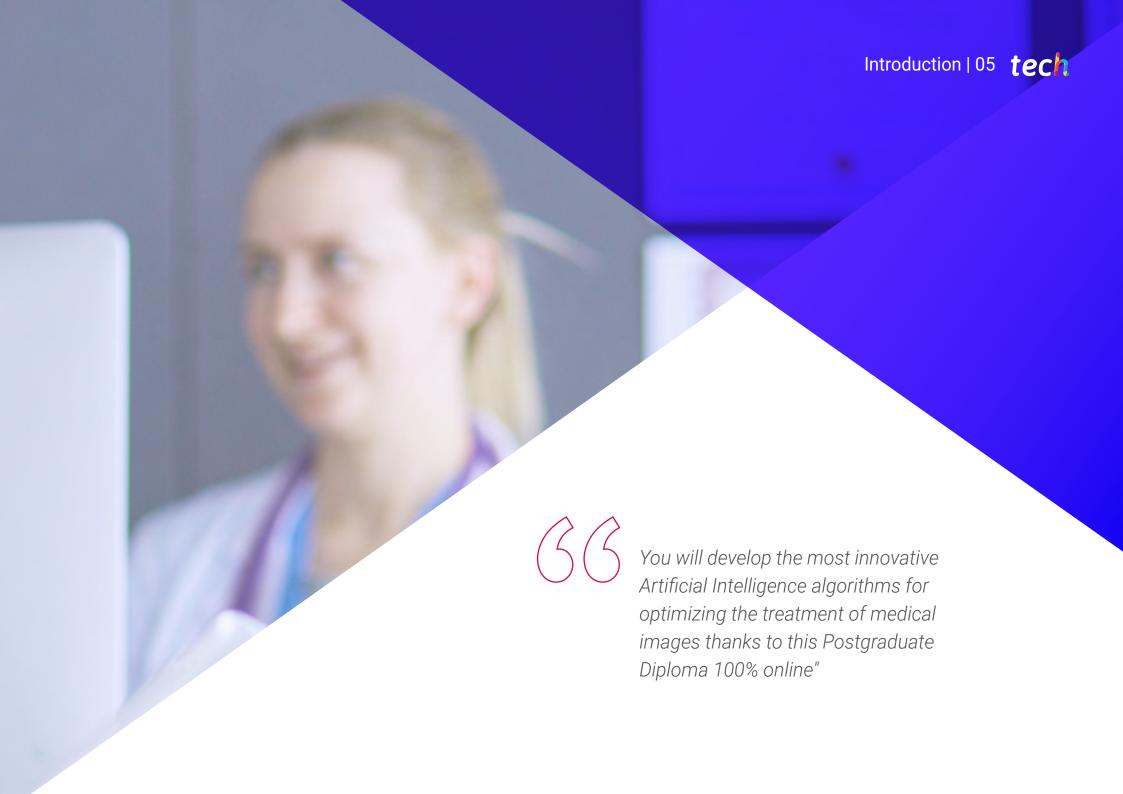
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# tech 06 | Introduction

Information and Communication Technologies are bursting into the healthcare field to completely transform the way medical care is provided. In this context, E-Health opens up a wide range of entrepreneurial opportunities for developers. Faced with the growing demand for Telemedicine products, professionals can take advantage of Artificial Intelligence to create new applications geared towards both health and wellness. They can also create novel devices capable of monitoring conditions such as diabetes or asthma to help citizens.

In this context, TECH implements a Postgraduate Diploma dedicated to business innovation in the area of e-Health. Designed by professionals in this field, the curriculum will address in detail the applications of Machine Learning to Telemedicine. In line with this, the syllabus will delve into essential aspects such as remote analysis of results, implementation of virtual assistants and real-time monitoring. In addition, the didactic materials will pay careful attention to the regulatory frameworks of remote medicine, including ISO Standards. In addition, the training will delve into various business models for entrepreneurship and innovation.

Because this program is delivered through a 100% online modality, students will be able to plan their own study schedules to experience a fully efficient learning experience. In addition, students will have access to a wide variety of multimedia resources designed to promote dynamic and natural learning. and natural learning. To access the Virtual Campus, students will only need a device with Internet access (including their own smartphone). They will also be supported at all times by an experienced teaching staff, who will resolve any doubts that may arise during the study process.

This Postgraduate Diploma in Applications of Artificial Intelligence, IoT, and Medical Devices in Telemedicine contains the most complete and up-to-date program on the market. The most important features include:

- The development of practical cases presented by experts in artificial intelligence and medical devices in telemedicine
- The graphic, schematic, and practical contents with which they are created, provide practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- The availability of access to content from any fixed or portable device with an Internet connection



You will acquire advanced skills that will enable you to undertake e-Health and develop highly personalized services"



Are you looking to enrich your projects with the most effective algorithms for image processing? Achieve it with this training in only 450 hours"

The program's teaching staff includes professionals from the industry who contribute their work experience to this 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 education programmed to learn 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 purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.

You will master the Graphic Processing Unit to run blood flow simulations and modeling of vital organs.

A syllabus designed under the most revolutionary and efficient pedagogical methodology, Relearning.







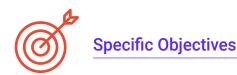
# tech 10 | Objectives



#### **General Objectives**

- Develop key concepts of medicine that serve as a vehicle to understand clinical medicine
- Determine the major diseases affecting the human body classified by apparatus or systems, structuring each module into a clear outline of pathophysiology, diagnosis, and treatment
- Determine how to obtain metrics and tools for healthcare management
- Understand the basics of basic and translational scientific methodology
- Examine the ethical and best practice principles governing the different types of research in health sciences
- Identify and generate the means of funding, assessing and disseminating scientific research
- Identify the real clinical applications of the various techniques
- Develop the key concepts of computational science and theory
- Determine the applications of computation and its implication in bioinformatics
- Provide the necessary resources to practically apply all the concepts in the modules
- Develop the fundamental concepts of databases
- Determine the importance of medical databases
- Delve into the most important techniques in research
- Identify the opportunities offered by the IoT in the field of eHealth

- Provide specialized knowledge of the technologies and methodologies used in the design, development and assessment of telemedicine systems
- Determine the different types and applications of telemedicine
- Study the most common ethical aspects and regulatory frameworks of telemedicine
- Analyze the use of medical devices
- Develop the key concepts of entrepreneurship and innovation in eHealth
- Determine what a business model is and the types that exist
- Collect eHealth success stories and mistakes to avoid
- Apply the knowledge acquired to an original business idea



# Module 1. Applications of Artificial Intelligence and the Internet of Things (IoT) in Telemedicine

- Analyze communication in the IoT as well as its use in eHealth areas
- Substantiate the complexity of artificial intelligence models in its use in healthcare
- Identify the optimization brought by parallelization in GPU-accelerated applications and its use in healthcare
- Present all the Cloud technologies available to develop e-Health and IoT products, both in computing and communication

#### Module 2. Telemedicine and Medical, Surgical and Biomechanical Devices

- Analyze the evolution of telemedicine
- Examine the different types, use and clinical benefits of telemedicine
- Assess the most common ethical aspects and regulatory frameworks for the use of telemedicine
- Establish the use of medical devices in healthcare in general and in telemedicine specifically
- Determine the use of the Internet and the medical resources it provides
- Delve into the main trends and future challenges in telemedicine

#### Module 3. Business Innovation and Entrepreneurship in eHealth

- Analyze the eHealth market in a systematic and structured way
- Create businesses using the Lean Startup methodology
- Analyze the market and competitors
- Find a solid value proposition in the marketplace
- · Identify opportunities and minimize rates of error
- Handle practical tools to analyze the environment and to quickly test and validate business ideas







# tech 14 | Course Management

#### Management



#### Ms. Sirera Pérez, Ángela

- Biomedical Engineer expert in Nuclear Medicine and exoskeleton design
- Designer of specific parts for 3D printing at Technadi
- Technician in the Nuclear Medicine area of the University Clinic of Navarra
- Degree in Biomedical Engineering from the University of Navarra
- MBA and Leadership in Healthcare and Medical Technology Companies

#### **Professors**

#### Ms. Muñoz Gutiérrez, Rebeca

- Data Scientist at INDITEX
- Firmware Engineer for Clue Technologies
- Graduate in Health Engineering, specializing in Biomedical Engineering from the University of Malaga and the University of Seville
- Master's Degree in Intelligent Avionics, Clue Technologies, in collaboration with the University of Málaga
- NVIDIA: Fundamentals of Accelerated Computing with CUDA C/C++
- NVIDIA: Accelerating CUDA C++ Applications with Multiple GPU

#### Dr. Somolinos Simón, Francisco Javier

- Biomedical Engineering Researcher at the Bioengineering and Telemedicine Group of the Polytechnic University of Madrid
- R&D&I Consultant at Evalue Innovation
- Biomedical Engineer and Researcher, Bioengineering and Telemedicine Group, Polytechnic University of Madrid
- PhD's Degree in Biomedical Engineering from the Polytechnic University of Madrid
- Graduate in Biomedical Engineering from the Polytechnic University of Madrid
- Master's Degree in Management and Development of Biomedical Technologies from Carlos III University of Madrid



## Course Management | 15 tech

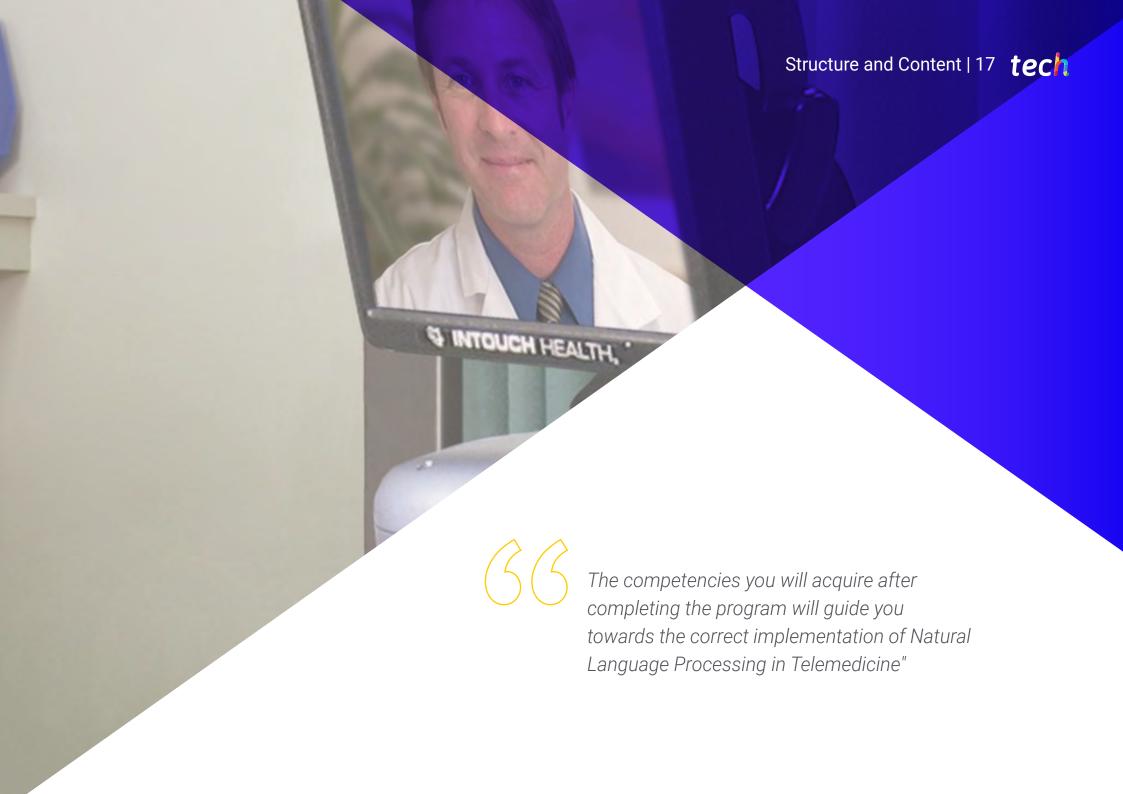
#### Ms. Crespo Ruiz, Carmen

- Intelligence, Strategy and Privacy Analysis Specialist
- Director of Strategy and Privacy at Freedom&Flow SL
- Co-founder of Healthy Pills SL
- Innovation Consultant & Project Technician, CEEI CIUDAD REAL
- Co-founder of Thinking Makers
- Data protection consultancy and training, Tangente Cooperative Group
- University Lecturer
- Law Degree, UNED (National University for Distance Education)
- Degree in Journalism, University Pontificia of Salamanca
- Master in Intelligence Analysis by the Cátedra Carlos III & Universidad
   Rey Juan Carlos, with the endorsement of the National Intelligence Center (CNI)
- Advanced Executive Program in Data Protection Officer



Take the opportunity to learn about the latest advances in this field in order to apply it to your daily practice"

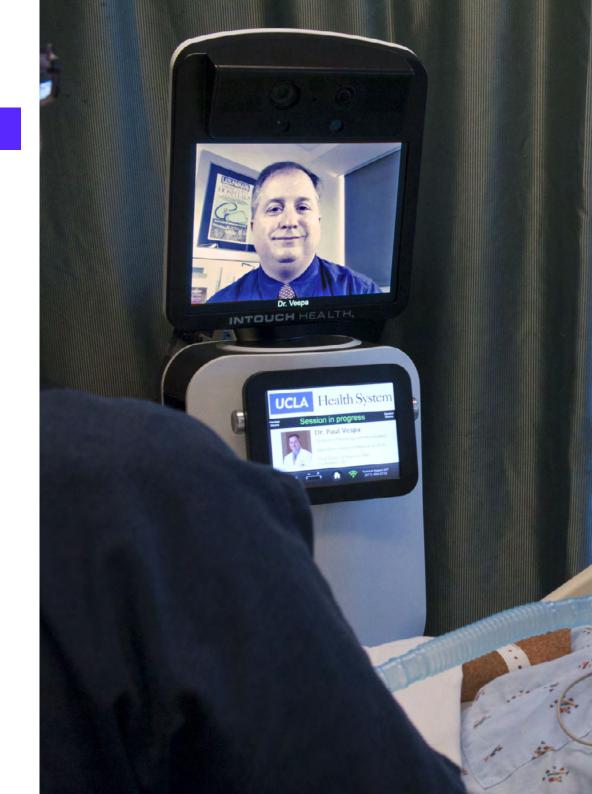


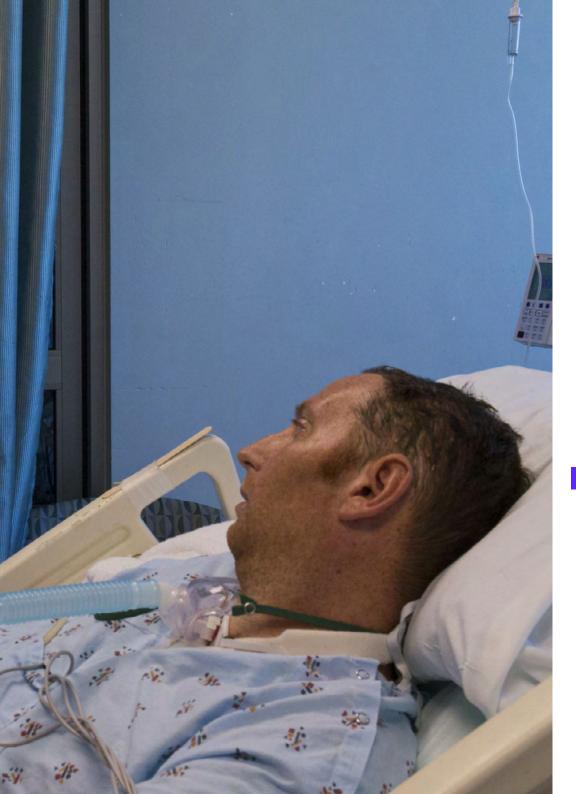


# tech 18 | Structure and Content

# **Module 1.** Applications of Artificial Intelligence and the Internet of Things (IoT) in Telemedicine

- 1.1. E-Health Platforms. Personalizing Healthcare Services
  - 1.1.1. e-Health Platforms
  - 1.1.2. Resources for e-Health Platforms
  - 1.1.3. Digital Europe Program. Digital Europe-4-Health and Horizon Europe
- 1.2. Artificial Intelligence in Healthcare I: New Solutions in Computer Applications
  - 1.2.1. Remote Analysis of Results
  - 1.2.2. Chatbox
  - 1.2.3. Prevention and Real-Time Monitoring
  - 1.2.4. Preventive and Personalized Medicine in Oncology
- 1.3. Artificial Intelligence in Healthcare II
  - 1.3.1. Monitoring Patients with Reduced Mobility
  - 1.3.2. Cardiac Monitoring, Diabetes, Asthma
  - 1.3.3. Health and Wellness Apps
    - 1.3.3.1. Heart Rate Monitors
    - 1.3.3.2. Blood Pressure Bracelets
  - 1.3.4. Ethical Use of Al in the Medical Field, Data Protection
- 1.4. Artificial Intelligence Algorithms for Image Processing
  - 1.4.1. Artificial Intelligence Algorithms for Image Handling
  - 1.4.2. Image Diagnosis and Monitoring in Telemedicine1.4.2.1 Melanoma Diagnosis
  - 1.4.3. Limitations and Challenges in Image Processing in Telemedicine
- 1.5. Application Acceleration using Graphics Processing Units (GPU) in Medicine
  - 1.5.1. Program Parallelization
  - 1.5.2. GPU Operations
  - 1.5.3. Application Acceleration using GPU in Medicine
- 1.6. Natural Language Processing (NLP) in Telemedicine
  - 1.6.1. Text Processing in the Medical Field. Methodology
  - 1.6.2. Natural Language Processing in Therapy and Medical Records
  - 1.6.3. Limitations and Challenges in Natural Language Processing in Telemedicine





## Structure and Content | 19 tech

- 1.7. The Internet of Things (IoT) in Telemedicine. Applications
  - 1.7.1. Monitoring Vital Signs. Wearables
    - 1.7.1.1. Blood Pressure, Temperature, and Heart Rate
  - 1.7.2. LoT and Cloud technology
    - 1.7.2.1. Data Transmission to the Cloud
  - 1.7.3. Self-Service Terminals
- 1.8. The IT in Patient Monitoring and Care
  - 1.8.1. The IT Applications for Emergency Detection
  - 1.8.2. The Internet of Things in Patient Rehabilitation
  - 1.8.3. Artificial Intelligence Support in Victim Recognition and Rescue
- 1.9. Nano-Robots. Typology
  - 1.9.1. Nanotechnology
  - 1.9.2. Types of Nano-Robots
    - 1.9.2.1. Assemblers. Applications
    - 1.9.2.2. Self-Replicating. Applications
- 1.10. Artificial Intelligence in COVID-19 Control
  - 1.10.1. Covid- 19 and Telemedicine
  - 1.10.2. Management and Communication of Breakthroughs and Outbreaks
  - 1.10.3. Outbreak Prediction in Artificial Intelligence

#### Module 2. Telemedicine and Medical, Surgical and Biomechanical Devices

- 2.1. Telemedicine and Telehealth
  - 2.1.1. Telemedicine as a Telehealth Service
  - 2.1.2. Telemedicine
    - 2.1.2.1. Telemedicine Objectives
    - 2.1.2.2. Benefits and Limitations of Telemedicine
  - 2.1.3. Digital Health. Technologies

# tech 20 | Structure and Content

2.2. Telemedicine Systems

	2.2.1.	Components in Telemedicine Systems	
		2.2.1.1. Personal	
		2.2.1.2. Technology	
	2.2.2.	Information and Communication Technologies (ICT) in the Health Sector	
		2.2.2.1. t-Health	
		2.2.2.2. m-Health	
		2.2.2.3. u-Health	
		2.2.2.4. p-Health	
	2.2.3.	Telemedicine Systems Assessment	
2.3.	Technology Infrastructure in Telemedicine		
	2.3.1.	Public Switched Telephone Network (PSTN)	
	2.3.2.	Satellite Networks	
	2.3.3.	Integrated Services Digital Network (ISDN)	
	2.3.4.	Wireless Technology	
		2.3.4.1. WAP. Wireless Application Protocol	
		2.3.4.2. Bluetooth	
	2.3.5.	Microwave Connections	
	2.3.6.	Asynchronous Transfer Mode (ATM)	
2.4.	Types of Telemedicine. Uses in Healthcare		
	2.4.1.	Remote Patient Monitoring	
	2.4.2.	Storage and Shipping Technologies	
	2.4.3.	Interactive Telemedicine	
2.5.	Telemedicine: General Applications		
	2.5.1.	Telecare	
	2.5.2.	Telemonitoring	
		Telediagnostics	
	2.5.4.	Teleeducation	
	2.5.5.	Telemanagement	

2.6.	Telemedicine: Clinical Applications			
	2.6.1.	Teleradiology		
	2.6.2.	Teledermatology		
	2.6.3.	Teleoncology		
	2.6.4.	Telepsychiatry		
	2.6.5.	Telehome-care		
2.7.	Smart Technologies and Care			
	2.7.1.	Integrating Smart Homes		
	2.7.2.	Digital Health to Improve Treatment		
	2.7.3.	Telehealth Clothing Technology. "Smart Clothes"		
2.8.	Ethical and Legal Aspects of Telemedicine			
	2.8.1.	Ethical Foundations		
	2.8.2.	Common Regulatory Frameworks		
	2.8.4.	ISO Standards		
2.9.	Telemedicine and Diagnostic, Surgical and Biomechanical Devices			
	2.9.1.	Diagnostic Devices		
	2.9.2.	Surgical Devices		
	2.9.2.	Biomechanic Devices		
2.10.	Telemedicine and Medical Devices			
	2.10.1.	Medical Devices		
		2.10.1.1. Mobile Medical Devices		
		2.10.1.2. Telemedicine Carts		
		2.10.1.3. Telemedicine Kiosks		
		2.10.1.4. Digital Cameras		
		2.10.1.5. Telemedicine Kit		

2.10.1.6. Telemedicine Software

#### Module 3. Business Innovation and Entrepreneurship in E-Health

- 3.1. Entrepreneurship and Innovation
  - 3.1.1. Innovation
  - 3.1.2. Entrepreneurship
  - 3.1.3. Startups
- 3.2. Entrepreneurship in e-Health
  - 3.2.1. Innovative E-Health Market
  - 3.2.2. Verticals in e-Health: mHealth
  - 3.2.3. TeleHealth
- 3.3. Business Models (I): First Stages in Entrepreneurship
  - 3.3.1. Types of Business Models
    - 3.3.1.1. Marketplaces
    - 3.3.1.2. Digital Platforms
    - 3 3 1 3 Saas
  - 3.3.2. Critical Elements in the Initial Phase. The Business Idea
  - 3.3.3. Common Mistakes in the First Stages of Entrepreneurship
- 3.4. Business Models (II): Business Model Canvas
  - 3 4 1 Canvas Business Model
  - 3.4.2. Value proposition
  - 3.4.3. Key Activities and Resources
  - 3.4.4. Customer Segments
  - 3.4.5. Customer Relationships
  - 3.4.6 Distribution Channels
  - 3.4.7. Partnerships
    - 3.4.7.1. Cost Structure and Revenue Streams
- 3.5. Business Models (III): Lean Startup Methodology
  - 3.5.1. Create
  - 3.5.2. Validate
  - 3.5.3. Measure
  - 3.5.4. Decide

- 3.6. Business Models (IV) External, Strategic and Regulatory Analysis
  - 3.6.1. Red Ocean and Blue Ocean Strategies
  - 3.6.2. Value Curves
  - 3.6.3. Applicable E-Health Regulations
- 3.7. Successful E-Health Models (I): Knowing Before Innovating
  - 3.7.1. Analysis of Successful E-Health Companies
  - 3.7.2. Analysis of Company X
  - 3.7.3. Analysis of Company Y
  - 3.7.4. Analysis of Company Z
- 3.8. Successful E-Health Models (II): Listening before Innovating
  - 3.8.1. Practical Interview: E-Health Startup CEO
  - 3.8.2. Practical Interview: "Sector X" Startup CEO
  - 3.8.3. Practical Interview: "Startup X" Technical Management
- 3.9. Entrepreneurial Environment and Funding
  - 3.9.1. Entrepreneur Ecosystems in the Health Sector
  - 3.9.2. Financing
  - 3.9.3. Funding
- 3.10. Practical Tools in Entrepreneurship and Innovation
  - 3.10.1. Open-Source Intelligence (OSINT)
  - 3.10.2. Analysis
  - 3.10.3. No-Code Tools in Entrepreneurship



A top-quality university program, which you can access comfortably from your cell phone, computer or tablet. Enroll now!"





# tech 24 | Methodology

#### 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 has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. 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 course, students 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 different teaching elements in each lesson.

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

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

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

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



### Methodology | 27 tech

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

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

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

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

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

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



#### **Study Material**

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

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



#### **Classes**

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

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



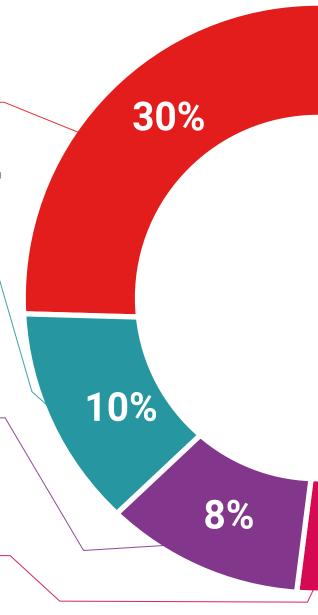
#### **Practising Skills and Abilities**

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



#### **Additional Reading**

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





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



#### **Interactive Summaries**

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

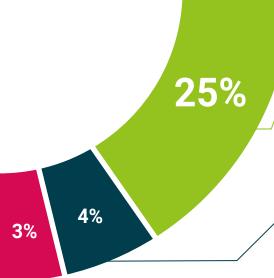


This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

#### **Testing & Retesting**

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





20%





# tech 32 | Certificate

This Postgraduate Diploma in Applications of Artificial Intelligence, IoT, and Medical Devices in Telemedicine contains the most complete and up-to-date program on the market.

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

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

Title: Postgraduate Diploma in Applications of Artificial Intelligence, IoT, and Medical Devices in Telemedicine

Official No of Hours: 450 h.



<sup>\*</sup>Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

technological university

Postgraduate Diploma Applications of Artificial Intelligence, IoT, and Medical Devices in Telemedicine

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

# Postgraduate Diploma

Applications of Artificial Intelligence, IoT, and Medical Devices in Telemedicine



