



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

» Modality: online

» Duration: 6 months

» Certificate: TECH Global University

» Credits: 18 ECTS

» Schedule: at your own pace

» Exams: online

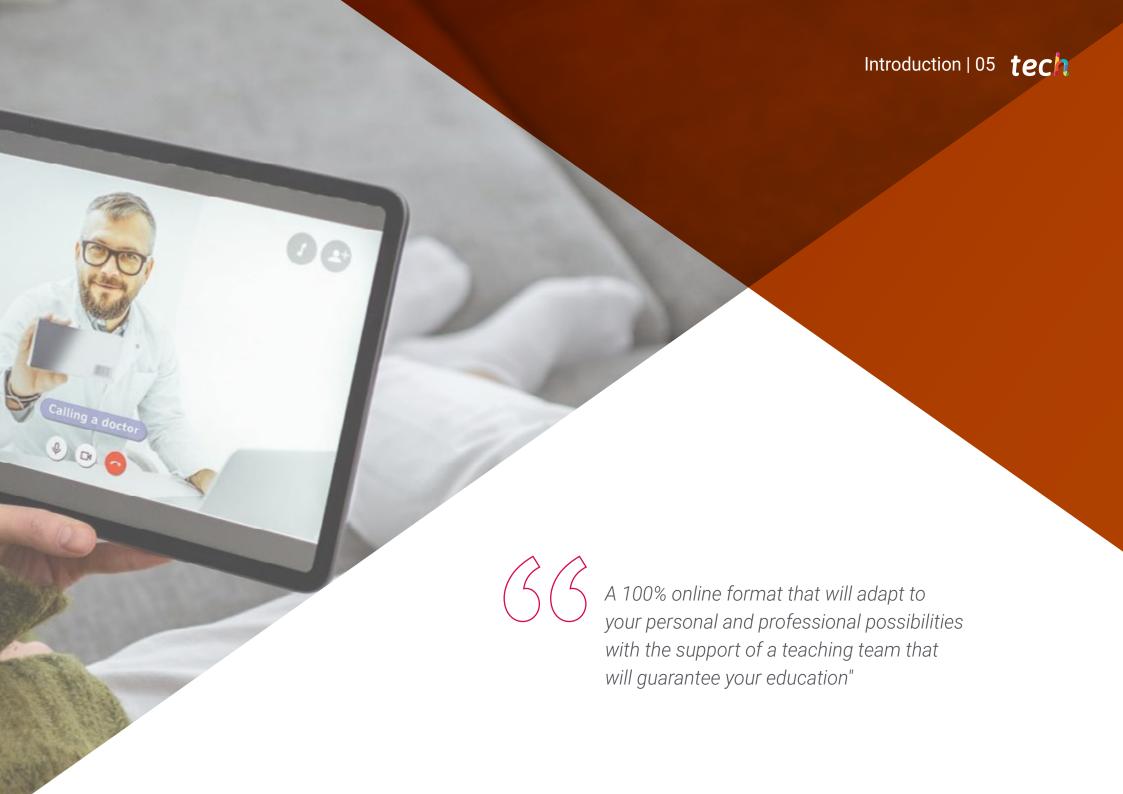
Website: www.techtitute.com/us/engineering/postgraduate-diploma/postgraduate-diploma-applications-artificial-intelligence-iot-medical-devices-telemedicine

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## tech 06 | Introduction

Advances in e-Health have created possibilities for personalized and automated healthcare. In this case, medical artificial intelligence makes it possible to monitor patients remotely or thanks to diagnostic imaging. Today, among the optimal advantages offered by telemedicine, they manage to save lives not only of patients, but also of healthcare professionals.

To create tools that project the usefulness of artificial intelligence in this field, expert engineers are required to master technological infrastructures, diagnostic, surgical and biomechanical devices, and to be able to create industrial diagnostic instruments. TECH offers this program to engineering graduates who want to develop their career towards the future of healthcare. This orientation will be guided in an exhaustive way by expert teachers in the area, who will guarantee their education.

The 100% online modality applied by TECH to investigate in this field, creates new online learning formulas, which provide facilities to the students. This Postgraduate Diploma in Applications of Artificial Intelligence, IoT and Medical Devices in Telemedicine will be taught through audiovisual content that will be available to students whenever and wherever they need it, even at the end of the program.

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

- 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
- Content that is accessible from any fixed or portable device with an Internet connection



Enroll in a program that will not only teach you to understand the operation of healthcare devices, but will also focus you on the technological perspective required for telemedicine"



Remote patient monitoring is now possible, explore its benefits against infectious diseases and become an expert in interactive telemedicine"

The program's teaching staff includes professionals from the sector who contribute their work experience to this educational 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 course. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

Still think artificial intelligence is our competitor? Sign up to become an expert in this area with GUP professionals.

Thanks to the knowledge that TECH will transmi, you will learn about the multiple advantages that IoT brings by communicating devices with each other.







## 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 e-Health
- 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
- Delve into 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 e-Health
- Determine what a business model is and the types that exist
- Collect e-Health success stories and mistakes to avoid
- Apply the knowledge acquired to an original business idea



## **Specific Objectives**

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

- Propose communication protocols in different scenarios in the healthcare field
- Analyze IoT communication, as well as its application areas in e-Health
- 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 implement e-Health and the IoT products, both in computing and communication

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

- Analyze the evolution of telemedicine
- Assess the benefits and limitations of telemedicine.
- Examine the different types, use and clinical benefits of telemedicine
- Assess the most common ethical issues and regulatory frameworks surrounding 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

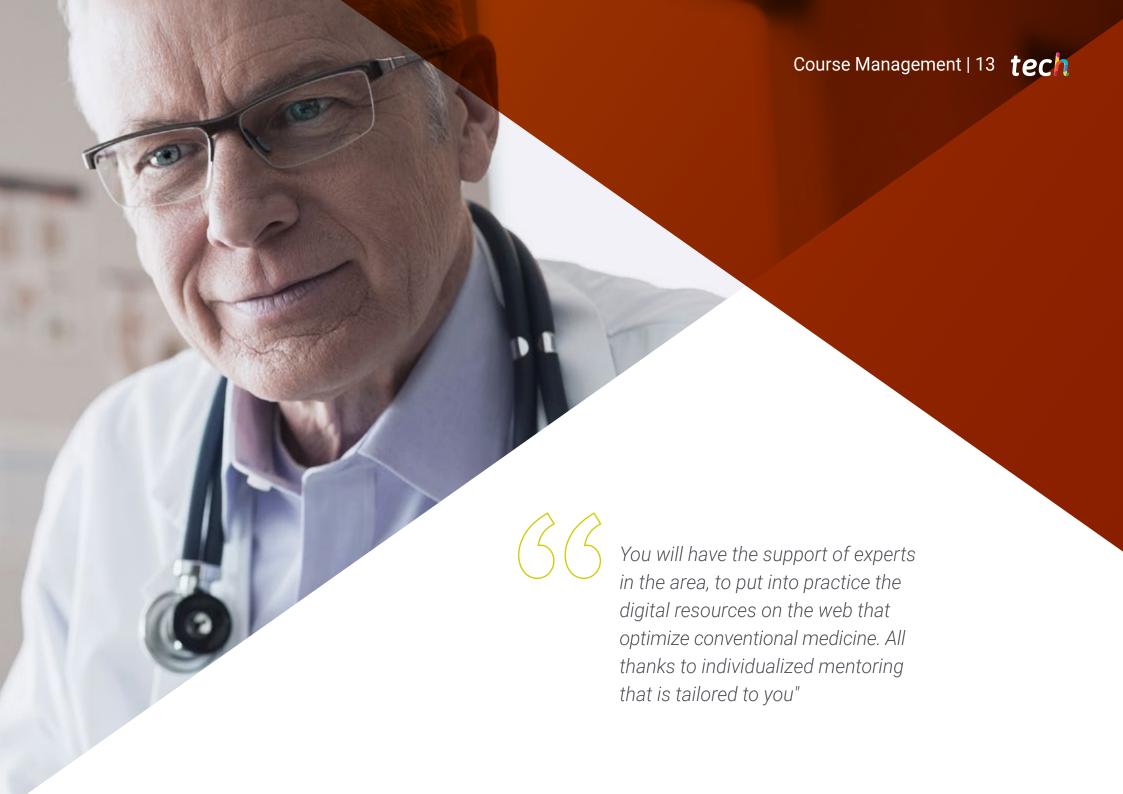
#### Module 3. Business Innovation and Entrepreneurship in E-Health

- Analyze the e-Health market in a systematic and structured way
- Learn the key concepts of innovative ecosystems
- 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's objective is to provide you with knowledge that will position you at the top of the e-Health market thanks to the Lean Startup methodology"





## 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**

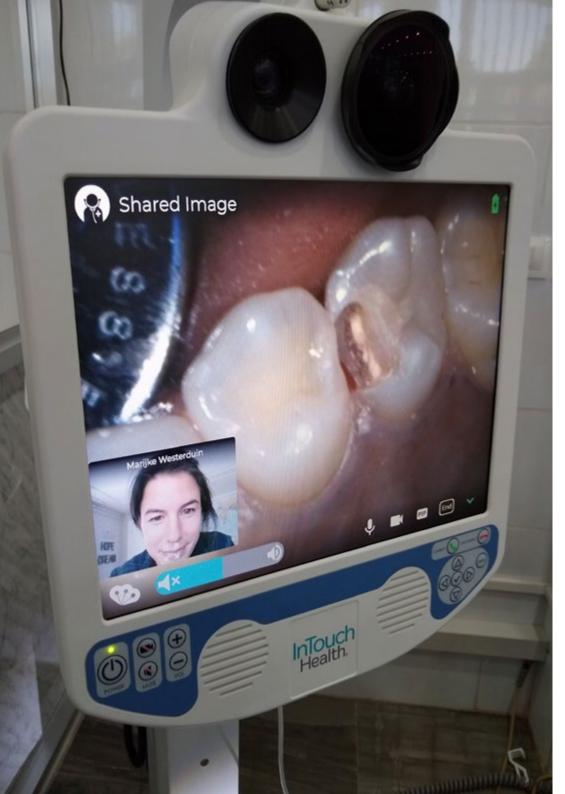
#### Ms. Muñoz Gutiérrez, Rebeca

- ◆ Data Scientist at INDITEX
- Firmware Engineer for Clue Technologies
- Graduate in Health Engineering, specializing in Biomedical Engineering, University of Malaga and 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 GPUs

#### 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 Engineering Researcher at the Bioengineering and Telemedicine Group of the Polytechnic University of Madrid
- D. 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





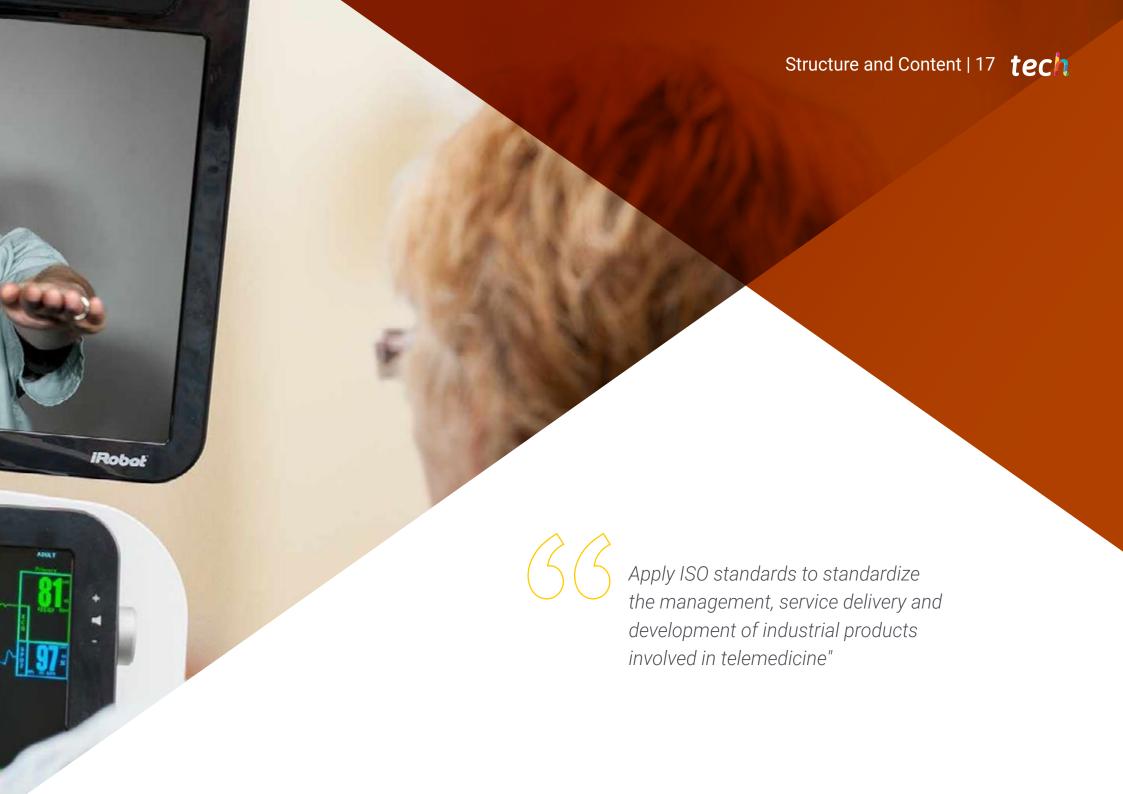
#### Ms. Crespo Ruiz, Carmen

- 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 Teacher
- Law Degree, UNED (National University for Distance Education)
- Degree in Journalism, University Pontificia of Salamanca
- Master's Degree in Intelligence Analysis, Carlos III and Rey Juan Carlos Universities, with the endorsement of the National Intelligence Center-CNI)
- Advanced Executive Program on Data Protection Officer



Make the most of this opportunity to learn about the latest advances in this area 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 Platform
  - 1.1.2. Resources for E-Health Platforms
  - 1.1.3. Digital Europe Program. Digital Europe-4-Health and Horizon Europe
- 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: Monitoring and Ethical Challenges
  - 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 Telemedicine
    - 1.4.2.1. 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
- 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. The IoT and Cloud Technology
    - 1.7.2.1. Data Transmission to the Cloud
  - 173 Self-Service Terminals
- 1.8. IT in Patient Monitoring and Care
  - 1.8.1. IoT 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. Nanorobots. Typology
  - 1.9.1. Nanotechnology
  - 1.9.2. Types of Nanorobots
    - 1.9.2.1. Assemblers. Applications
    - 1.9.2.2. Self-Replicators. 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
- 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. M-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
  - 2.5.3. Telediagnostics
  - 2.5.4. Tele-education
  - 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. Home Care (Telehomecare)
- 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. Biomechanical 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

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### 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: M-Health
  - 3.2.3. Tele-Health
- 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



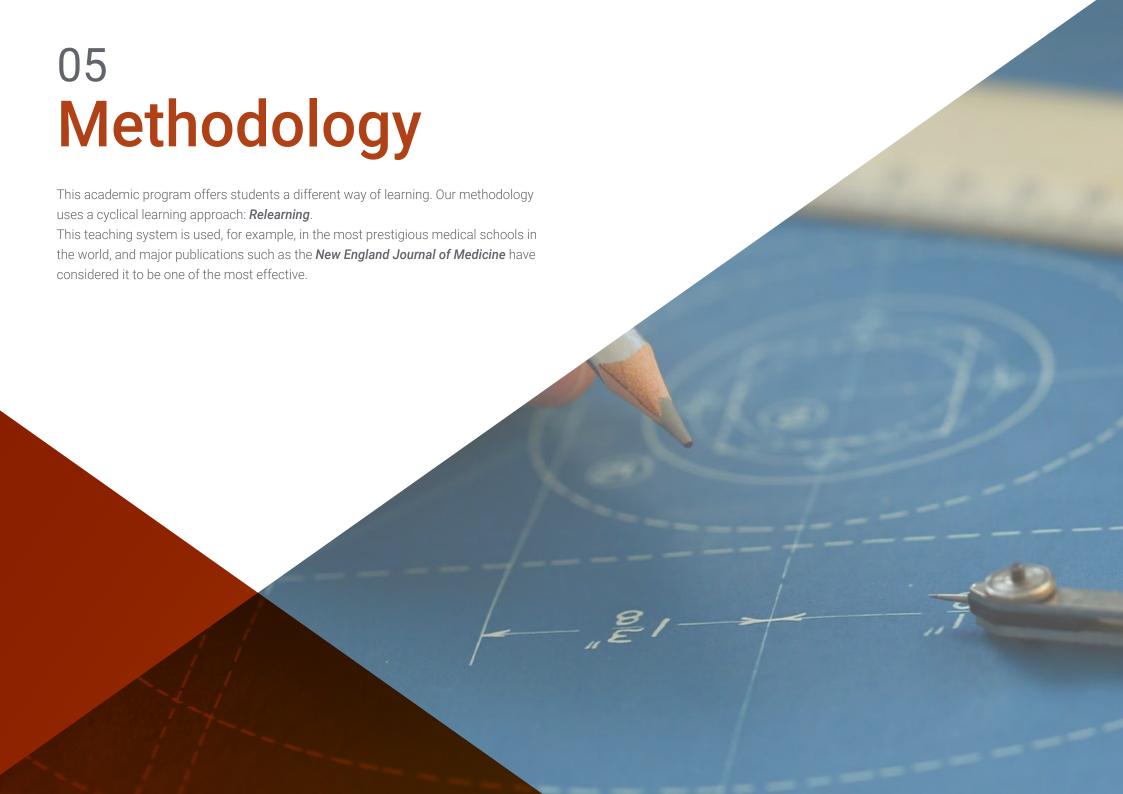


## Structure and Content | 21 tech

- 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 program designed for professionals like you, who understand artificial intelligence as the future of telemedicine"





## tech 24 | Methodology

## Case Study to contextualize all content

Our program offers a revolutionary method of skills and knowledge development. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.





You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.

## Methodology | 25 tech



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.

## tech 26 | Methodology

## 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 prepare 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 prepared 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 education, 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 adapted in 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 competencies and skills in each thematic field. 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.

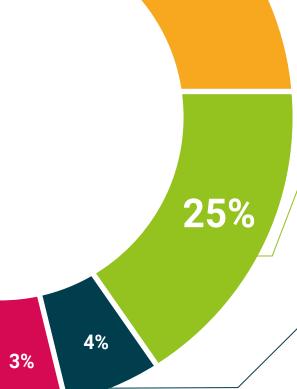


This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

### **Testing & Retesting**

We periodically assess and re-assess 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 program will allow you to obtain your **Postgraduate Diploma in Applications of Artificial Intelligence, IoT, and Medical Devices in Telemedicine** endorsed by **TECH Global University**, the world's largest online university.

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

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

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

Modality: online

Duration: 6 months

Accreditation: 18 ECTS



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

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

This is a program of 450 hours of duration equivalent to 18 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

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

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



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



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