# Postgraduate Certificate

## Personalized Healthcare through Artificial Intelligence

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# Postgraduate Certificate

## Personalized Healthcare through Artificial Intelligence

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

Website: **www.techtitute.com/in/medicine/postgraduate-certificate/personalized-healthcare-artificial-intelligence**

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01

# Introduction

The application of Artificial Intelligence (AI) in Genomic Medicine has great potential to drive personalized healthcare, enabling a more targeted treatment approach for patients. For example, its algorithms serve to identify genetic variants associated with specific conditions. This allows specialists to detect certain predispositions early and develop personalized therapeutic plans. These mechanisms can also be used to predict how users will respond to drugs, avoiding those that may have undesirable side effects. In this context, TECH has implemented this program aimed at physicians who wish to master the most innovative tools from the point of view of individualized therapeutics. Moreover, it is delivered 100% online and allows specialists to broaden their competencies while sustaining their daily practice.

*TECH's 100% online methodology will allow you to update your knowledge on the personalization of health treatments through Artificial Intelligence without interrupting your professional work"*

When patients have the opportunity to participate in decision-making about their care, they feel more empowered and satisfied with the care they receive. This can contribute to greater adherence to treatments, which will result in more positive health outcomes. Aware of this, medical staff employing AI tools need to foster user autonomy and actively engage users with therapeutic processes. To this end, these specialists must explain both their decisions and recommendations in an understandable way. In this way, the plans will be configured according to the preferences and individual contexts of the patients.

In this sense, TECH will have an exhaustive program that will delve into the personalization of healthcare through Artificial Intelligence. Developed by an experienced teaching staff, this syllabus will delve into various applications of Intelligent Automation in genomics for individualized medicine. In addition, the syllabus will provide guidelines for handling intelligent devices effectively, allowing students to perform advanced monitoring tasks. In line with this, the didactic materials will discuss the advances that have been made in assisted surgical robotics in recent years. The university program will also address predictive analysis, so that graduates can efficiently optimize resources and prevent situations such as epidemiological outbreaks.

It should be noted that the methodology of this program reinforces its innovative character. TECH offers a 100% online educational environment, which will allow students to combine their studies with the rest of their daily obligations. Similarly, the university program is supported by the innovative Relearningteaching system, based on the repetition of key concepts to fix knowledge and facilitate learning. The combination of flexibility and a robust pedagogical approach makes it highly accessible.

This **Postgraduate Certificate in Personalized Healthcare through Artificial Intelligence** contains the most complete and up-to-date scientific on the market.
Its most notable features are:

- The development of case studies presented by experts in Artificial Intelligence in Clinical Practice
- The graphic, schematic, and practical contents with which they are created provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where the self-assessment process can be carried out 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

*After this Postgraduate Certificate, you will apply the most advanced predictive models in your clinical practice and you will make your medical care stand out for its quality"*

*You will make the best clinical decisions taking into account aspects such as medical history, age or patient preferences after this TECH program"*

*You will learn more about predictive analysis in public health to contribute to the planning and distribution of campaigns aimed at vaccination.*

*The Relearning system will allow you to expand your knowledge with less effort and more performance, involving you more in your specialization.*

The program's teaching staff includes professionals from the sector who contribute their work experience to this training 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.

02

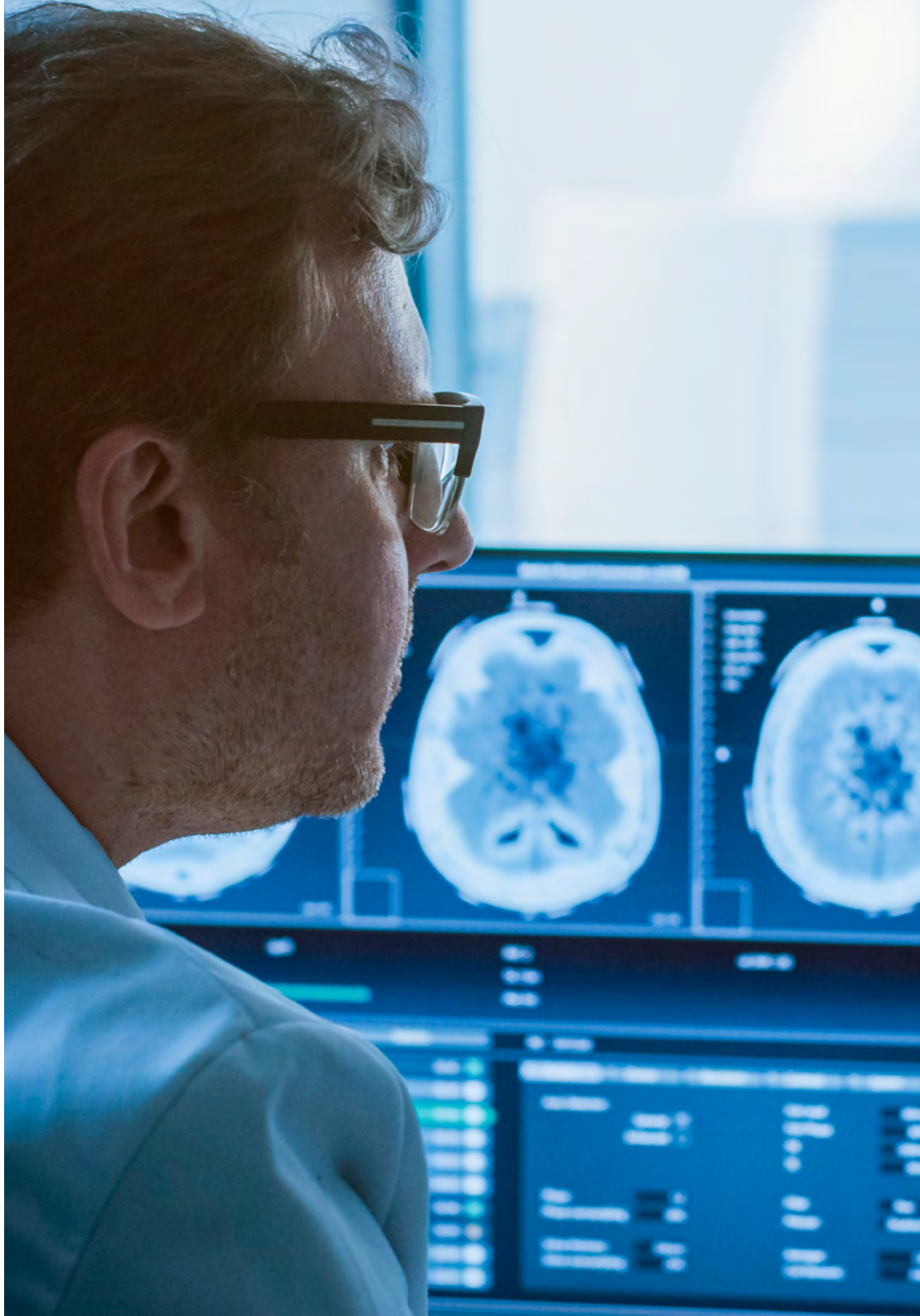
# Objectives

Thanks to this comprehensive program, physicians will acquire advanced skills in the application of AI in the clinical context. In this way, they will be highly qualified to personalize medical treatments according to the personal circumstances of patients. Likewise, as graduates of this program, they will use the development of algorithms for specific applications, including drug design and monitoring. In addition, they will develop a comprehensive perspective on the latest trends in this healthcare field. This will allow them to anticipate the difficulties that arise in their practice and will help them to innovate in an area with many opportunities.

*Complete this program and you will develop individualized medical treatments ranging from genomic analysis to pain management"*

## General Objectives

- Understand the theoretical foundations of Artificial Intelligence
- Study the different types of data and understand the data lifecycle
- Evaluate the crucial role of data in the development and implementation of AI solutions
- Delve into algorithms and complexity to solve specific problems
- Explore the theoretical basis of neural networks for Deep Learning development
- Analyze bio-inspired computing and its relevance in the development of intelligent systems
- Analyze current strategies of Artificial Intelligence in various fields, identifying opportunities and challenges
- Critically evaluate the benefits and limitations of AI in healthcare, identifying potential pitfalls and providing an informed assessment of its clinical application
- Recognize the importance of collaboration across disciplines to develop effective AI solutions
- Gain a comprehensive perspective of emerging trends and technological innovations in AI applied to healthcare
- Acquire solid knowledge in medical data acquisition, filtering, and preprocessing
- Understand the ethical principles and legal regulations applicable to the implementation of AI in medicine, promoting ethical practices, fairness, and transparency





## Specific Objectives

- Delve into emerging trends in AI applied to personalized health and its future impact
- Define AI applications for customizing medical treatments, ranging from genomic analysis to pain management
- Differentiate specific AI algorithms for the development of applications related to drug design or surgical robotics
- Delimit emerging trends in AI applied to personalized health and its future impact
- Promote innovation by developing strategies to improve health care

*You will have in your hands a flexible university program, without fixed schedules and with a content available 24 hours a day"*

03

# Course Management

TECH offers elite teaching for students to successfully study the programs. Therefore, it has selected a prestigious teaching staff for the development of this Postgraduate Certificate. Through their guidance, physicians will update their knowledge and renew their skills to provide care based on personalization. These professionals have an extensive professional background, which has allowed them to be part of prestigious international hospitals. Thanks to this, the study plan will provide the specialist with the latest scientific advances in this health field.

*An experienced teaching staff will guide you throughout the learning process and solve any doubts you may have"*

## Management

### Dr. Arturo Peralta Martín-Palomino

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO at AI Shephers GmbH
- Consultant and Strategic Business Advisor at Alliance Medical
- Director of Design and Development at DocPath
- Ph.D. in Psychology from the University of Castilla - La Mancha
- Ph.D. in Economics, Business and Finance from the Camilo José Cela University
- Ph.D. in Psychology from University of Castilla – La Mancha
- Professional Master's Degree in Executive MBA by the Isabel I University
- Professional Master's Degree in Sales and Marketing Management, Isabel I University
- Expert Master's Degree in Big Data by Hadoop Training
- Professional Master's Degree in Advanced Information Technologies from the University of Castilla - La Mancha
- Member of: SMILE Research Group

## Mr. Martín-Palomino Sahagún, Fernando

- Telecommunications Engineer
- *Chief Technology Officer* and R+D+i Director at AURA Diagnostics (medTech)
- Business Development at SARLIN
- Chief Operating Officer at Alliance Diagnostics
- Chief Innovation Officer at Alliance Medical
- *Chief Information Officer* at Alliance Medical
- *Field Engineer & Project Management* in Digital Radiology at Kodak
- MBA from Polytechnic University of Madrid
- Executive Master in Marketing and Sales at ESADE
- Telecommunications Engineer from the University Alfonso X El Sabio

## Professors

### Dr. Carrasco González, Ramón Alberto

- Specialist in Computer Science and Artificial Intelligence
- Researcher
- Head of *Business Intelligence* (Marketing) at Caja General de Ahorros de Granad and Banco Mare Nostrum.
- Head of Information Systems (*Data Warehousing and Business Intelligence*) at Caja General de Ahorros de Granada and Banco Mare Nostrum
- Ph.D. in Artificial Intelligence from the University of Granada
- Computer Engineer from the University of Granada

### Mr. Popescu Radu, Daniel Vasile

- Pharmacology, Nutrition and Diet Specialist
- Freelance Producer of Didactic and Scientific Contents
- Nutritionist and Community Dietitian
- Community Pharmacist
- Researcher
- Professional Master's Degree in Nutrition and Health at the Oberta University of Catalonia (UOC)
- Professional Master's Degree in Psychopharmacology from the University of Valencia
- Pharmacist by the Complutense University of Madrid
- Nutritionist-Dietician at the European University Miguel de Cervantes

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

04

# Structure and Content

This university program will comprehensively address the impact of AI on personalized health care. The syllabus will delve into assisted genomic analysis to design personalized treatments, exploring how cognitive computing interprets generic data. It will also delve into the role of AI in the development of drugs, integration of solutions in monitoring devices and creation of supports to make clinical decisions. The teaching materials will also address the latest advances in surgical robotics and trends in health personalization.

*Do you want to experience a quality leap in your career? With TECH you will be able to update your clinical practice through exclusive multimedia teaching resources"*

## **Module 1.** Personalization of Healthcare through AI

1.1. Applications of AI in Genomics for Personalized Medicine
- 1.1.1. Development of AI Algorithms for the Analysis of Genetic Sequences and their Relationship with Diseases
- 1.1.2. Use of AI in Identifying Genetic Markers for Personalized Treatments
- 1.1.3. AI Implementation for Fast and Accurate Interpretation of Genomic Data
- 1.1.4. AI Tools in Genotype Correlation with Drug Responses

1.2. AI in Pharmacogenomics and Drug Design
- 1.2.1. Development of AI Models to Predict Drug Efficacy and Safety
- 1.2.2. Use of AI in the Identification of Therapeutic Targets and Drug Design
- 1.2.3. Application of AI in the Analysis of Gene-drug Interactions for Treatment Customization
- 1.2.4. Implementing AI Algorithms to Accelerate Discovery of New Drugs

1.3. Personalized Monitoring with Smart Devices and AI
- 1.3.1. Development of Wearables with AI for Continuous Monitoring of Health Indicators
- 1.3.2. Use of AI in Interpreting Data Collected by Smart Devices
- 1.3.3. Implementation of AI-based Early Warning Systems for Health Conditions
- 1.3.4. AI Tools for Customizing Lifestyle and Health Recommendations

1.4. Clinical Decision Support Systems with AI
- 1.4.1. AI Implementation to Assist Physicians in Clinical Decision Making
- 1.4.2. Development of AI Systems that Provide Recommendations Based on Clinical Data
- 1.4.3. Use of AI in the Assessment of Risks and Benefits of Different Therapeutic Options
- 1.4.4. AI Tools for Real-time Health Data Integration and Analysis

1.5. Trends in Health Personalization with AI
- 1.5.1. Analyzing the Latest AI Trends for Customizing Healthcare
- 1.5.2. Use of AI in the Development of Preventive and Predictive Approaches in Health
- 1.5.3. Implementing AI in Adapting Health Plans to Individual Needs
- 1.5.4. Exploring New AI Technologies in the Field of Personalized Health

1.6. Advances in AI-assisted Surgical Robotics
- 1.6.1. Development of Surgical Robots with AI for Precise and Minimally Invasive Procedures
- 1.6.2. Using AI to Improve Accuracy and Safety in Robot-assisted Surgeries
- 1.6.3. Implementation of AI Systems for Surgical Planning and Simulation of Operations
- 1.6.4. Advances in the Integration of Tactile and Visual Feedback in Surgical Robotics with AI

1.7. Development of Predictive Models for Personalized Clinical Practice
- 1.7.1. Using AI to Create Predictive Disease Models Based on Individual Data
- 1.7.2. Implementation of AI in Predicting Treatment Responses
- 1.7.3. Development of AI Tools for Anticipating Health Risks
- 1.7.4. Applying Predictive Models in Planning Preventive Interventions

1.8. AI in Personalized Pain Management and Treatment
- 1.8.1. Development of AI Systems for Personalized Pain Assessment and Management
- 1.8.2. Use of AI in Identifying Pain Patterns and Responses to Treatments
- 1.8.3. Implementing AI Tools in Customizing Pain Therapies
- 1.8.4. Application of AI in Monitoring and Adjusting Pain Treatment Plans

1.9. Patient Autonomy and Active Participation in Personalization
- 1.9.1. Promoting Patient Autonomy through AI Tools for Managing Patient Health
- 1.9.2. Development of AI Systems that Empower Patients in Decision Making
- 1.9.3. Using AI to Provide Personalized Information and Education to Patients
- 1.9.4. AI Tools that Facilitate Active Patient Participation in Treatment

1.10. Integration of AI in Electronic Medical Records
- 1.10.1. AI Implementation for Efficient Analysis and Management of Electronic Medical Records
- 1.10.2. Development of AI Tools for Extracting Clinical Insights from Electronic Records
- 1.10.3. Using AI to Improve Accuracy and Accessibility of Data in Medical Records
- 1.10.4. Application of AI for the Correlation of Clinical History Data with Treatment Plans

*Acquire knowledge without geographical limitations or preset timing thanks to the complete TECH Virtual Campus. Don't wait any longer and enroll now"*

05

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

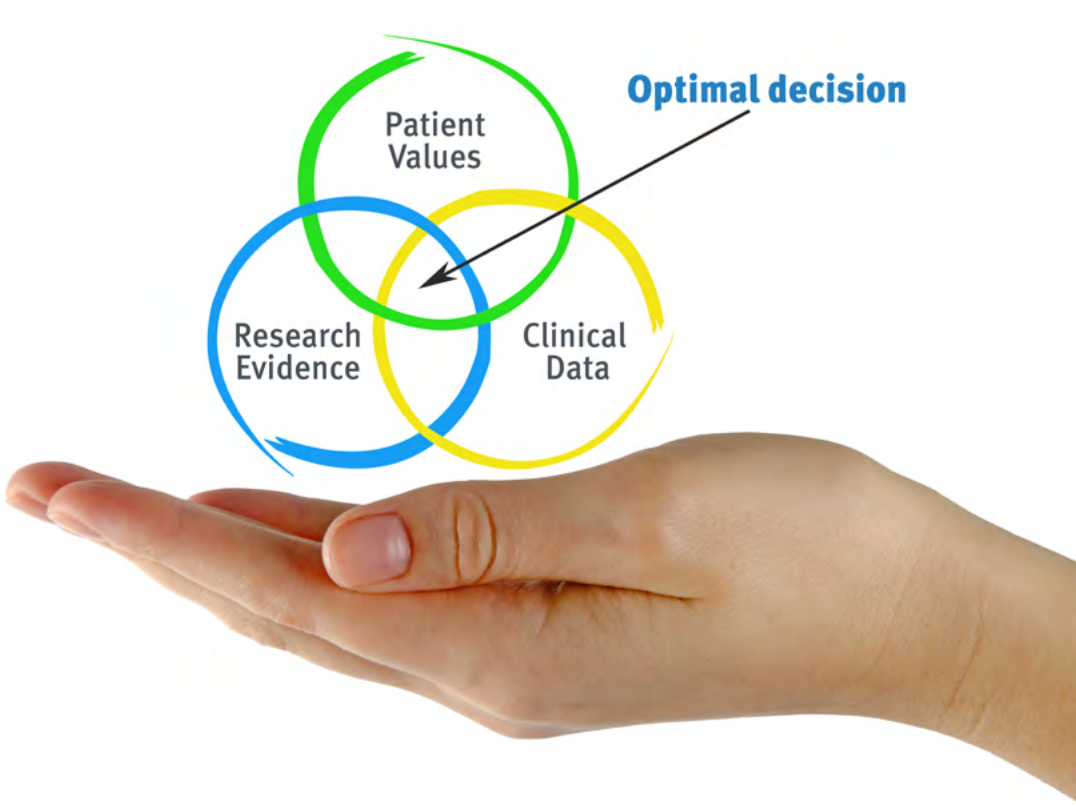
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

*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"*

## At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

*With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.*




According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the physician's professional practice.

*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"*

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

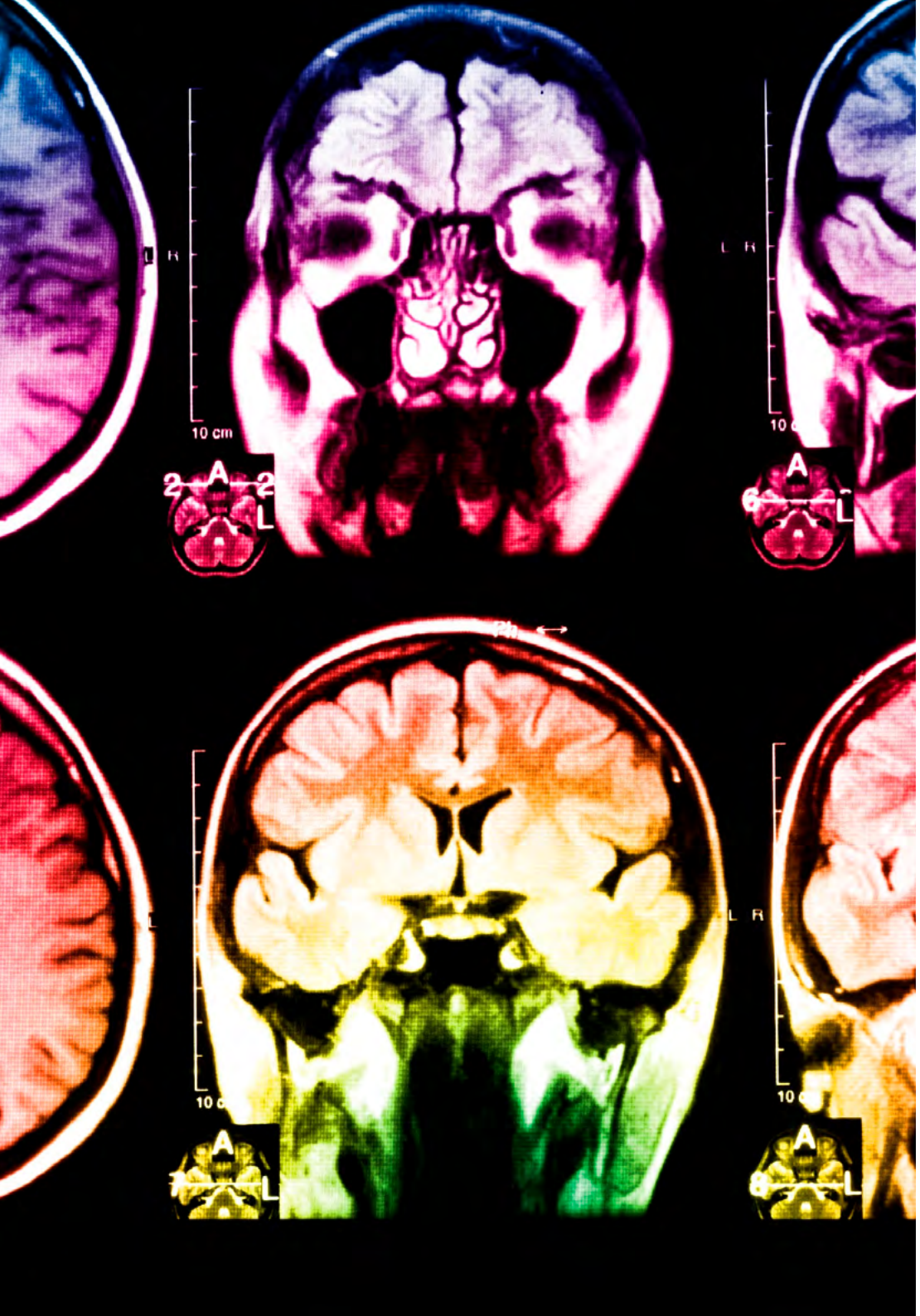
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better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

## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

*Professionals will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*




At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

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

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.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.

**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.

### Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.

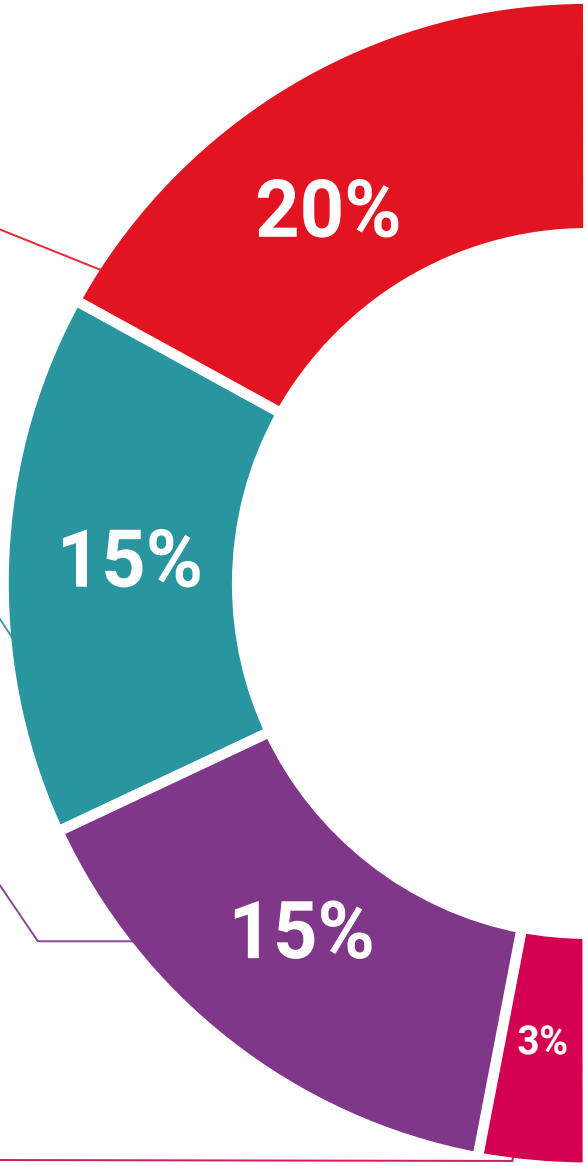
### Interactive Summaries

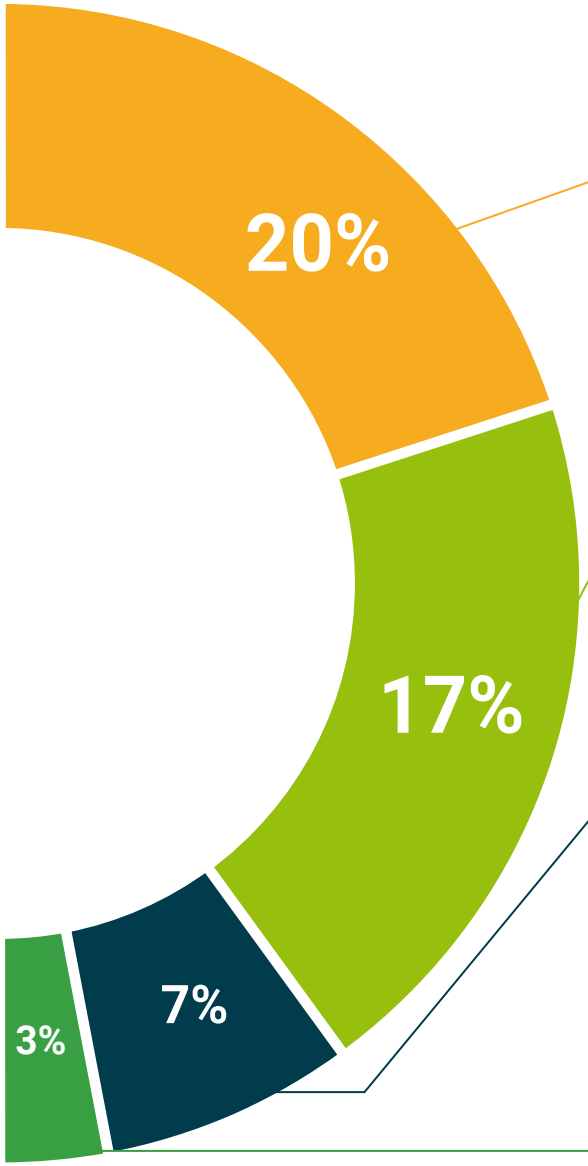
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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

### 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.






### Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.

### 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.

### Classes

There is scientific evidence on the usefulness of learning by observing experts. The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

### Quick Action Guides

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

06

# Certificate

The Postgraduate Certificate in Personalized Healthcare through Artificial Intelligence guarantees, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate 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 Certificate in Personalized Healthcare through Artificial Intelligence** contains the most complete and up-to-date scientific on the market.

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

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

Title: **Postgraduate Certificate in Personalized Healthcare through Artificial Intelligence**

Official Nº of Hours: **150 h.**


tech technological university

Awards the following

CERTIFICATE

to

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

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Personalized Healthcare through Artificial Intelligence

This is a qualification awarded by this University, equivalent to 150 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.

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