Postgraduate Diploma

Diagnosis, Treatment and Personalization of Medical Treatment with Artificial Intelligence

tech global university

Postgraduate Diploma
Diagnosis, Treatment
and Personalization of
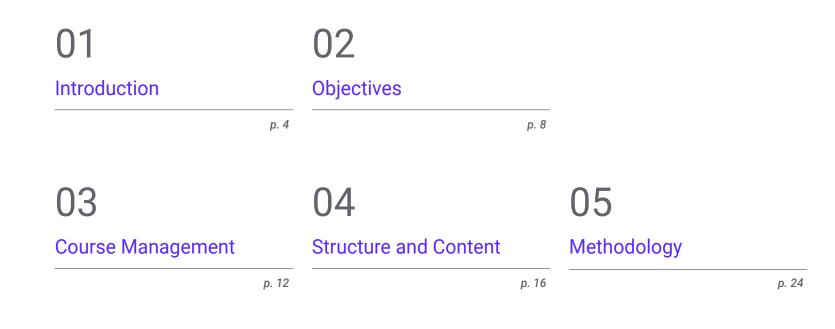Medical Treatment with
Artificial Intelligence

» Modality: **online**
» Duration: **6 monthst**
» Certificate: **TECH Global University**
» Credits: **18 ECTS**
» Schedule: **at your own pace**
» Exams: **online**

Website: **www.techtitute.com/us/artificial-intelligence/postgraduate-diploma/postgraduate-diploma-diagnosis-treatment-personalization-medical-treatment-artificial-intelligence**

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01
Introduction

Diagnostics in clinical practice using Artificial Intelligence (AI) offers important applications aimed at improving medical care. For example, in busy healthcare environments, Machine Learning helps to prioritize cases and patients based on the severity of their condition. This ensures that the most critical users receive care more quickly. At the same time, this tool is useful for continuously monitoring people with chronic pathologies (such as diabetes or hypertension) and providing early alerts when changes in health data are detected. Aware of its relevance, TECH has developed a university program that will delve into the clinical approach through the most innovative algorithms. And all in a convenient 100% online mode.

Join this 100% online program now, where you will delve into Machine Learning Algorithms and their applications in Medical Research"

AI Algorithms play a key role in establishing personalized therapeutic treatments. This set of computer-defined instructions uses clinical as well as biomedical or genetic data to develop predictive models. In this way, specialists apply personalized therapies and can predict responses to treatments so that they have a higher probability of success. In addition, these tools can accurately calculate drug doses, which improves the efficacy of approaches.

In this context, TECH is creating an advanced program that will delve into the use of Machine Learning during the planning and execution of medical procedures. Under the guidance of a well-versed faculty, this curriculum will analyze pattern recognition and *Machine Learning* in clinical diagnostics. Therefore, specialists will correctly interpret medical images to provide the most appropriate treatments for each individual. The syllabus will also provide comprehensive skills on the most innovative therapeutic protocols. In this line, the didactic materials will offer the latest advances in assisted surgical robotics so that graduates will remain at the technological forefront.

In addition, the program's methodology will be a reference in the field of robotic assisted surgery. With a 100% online format, it will allow graduates to advance in their specialization without compromising their job responsibilities. In addition, the application of the *Relearning* system, based on the reiteration of key concepts, ensures a deep and lasting understanding. This pedagogical approach reinforces the ability of professionals to effectively apply the knowledge acquired in their daily practice. In turn, the only thing physicians will need to complete this academic pathway will be a device with Internet access and a commitment to update their knowledge that will allow them to experience a leap in quality in their careers.

This **Postgraduate Diploma in Diagnosis, Treatment and Personalization of Medical Treatment with Artificial Intelligence** contains the most complete and up-to-date program on the market. The most important features include:

- Development of practical cases 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 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

" *You will apply Artificial Intelligence to respond to health emergencies such as epidemiological outbreaks and in the development of new vaccines"*

You will perform multimodal clinical data integrations to achieve more accurate diagnoses.

"*You will promote patient autonomy through active participation in the design of personalized treatments following the study of this program*"

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

The program's teaching staff includes professionals from the sector 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.

02
Objectives

This curriculum will allow the physician to develop skills to apply the tools of Machine Learning to clinical practice. In this way, graduates will be able to make assisted diagnoses, analyze medical images and interpret their results correctly. In turn, experts will gain a holistic approach to design and execute personalized medical treatments according to the specificities of the users. They will also master emerging trends to provide solutions in diverse areas, such as advanced monitoring with smart devices.

"You will acquire a comprehensive vision of the application of Artificial Intelligence in the field of health thanks to this 100% online Postgraduate Diploma"

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 on 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

Module 1. Diagnosis in Clinical Practice Using AI

- Critically analyze the benefits and limitations of AI in health care
- Identify potential pitfalls, providing an informed assessment of its application in clinical settings
- Recognize the importance of collaboration across disciplines to develop effective AI solutions
- Develop competencies to apply AI tools in the clinical setting, focusing on aspects such as assisted diagnosis, medical image analysis and interpretation of results
- Identify potential pitfalls in the application of AI in healthcare, providing an informed view of its use in clinical settings

Module 2. Treatment and Management of the AI Patient

- Interpret results for ethical *dataset* creation and strategic application in healthcare emergencies
- Acquire advanced skills in the presentation, visualization and management of healthcare AI data
- Gain a comprehensive perspective on emerging trends and technological innovations in AI applied to healthcare
- Develop AI algorithms for specific applications such as health monitoring, facilitating the effective implementation of solutions in medical practice
- Design and implement individualized medical treatments by analyzing patients' clinical and genomic data with AI

Module 3. Health Personalization through AI

- Delve into emerging trends in AI applied to personalized healthcare and their future impact
- Define the applications of AI to personalize 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
- Delineate emerging trends in AI applied to personalized health and their future impact
- Promote innovation through the creation of strategies aimed at improving medical care

An academic institution that adapts to you and designs a program that will allow you to reconcile your daily activities with a quality program"
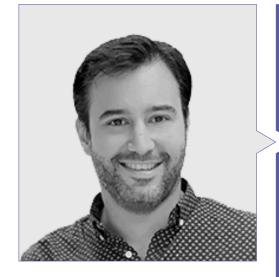
Course Management

In its maxim of offering educational excellence, TECH brings together a team of top-notch teachers. The professionals who make up this Postgraduate Diploma have extensive research and application experience in the field of Diagnosis, Treatment and Personalization of Medical Treatment with AI. Their excellent results have allowed them to work in the most prestigious hospitals. Accordingly, these specialists pour into this program all their knowledge in order to guarantee a successful learning process that allows students to acquire skills that they can immediately incorporate into their practice.

"
An experienced teaching group will guide you throughout the learning process and will resolve any doubts that may arise"

Management

Dr. Peralta Martín-Palomino, Arturo
- 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
- Máster in Executive MBA por la Universidad Isabel I
- Master's Degree in Sales and Marketing Management, Isabel I University
- Expert Master's Degree in Big Data by Hadoop Training
- Master's Degree in Advanced Information Technologies from the University of Castilla - la Mancha
- Member of: SMILE Research Group

Mr. Martín-Palomino Sahagún, Fernando

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

Professors

Dr. Carrasco González, Ramón Alberto

- Computer Science and Artificial Intelligence Specialist
- Researcher
- Head of *Business Intelligence* (Marketing) at Caja General de Ahorros de
- Granada and at el Banco Mare Nostrum
- Head of Information Systems (*Data Warehousing and Business Intelligence*) at Caja General de Ahorros de Granada and Banco Mare Nostrum
- PhD in Artificial Intelligence, 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
- Master's Degree in Nutrition and Health at the Universidad Oberta de Catalunya
- Master's Degree in Psychopharmacology, University of Valencia
- Pharmacist by the Complutense University of Madrid
- Nutritionist-Dietician by the European University Miguel de Cervantes

04
Structure and Content

This program will delve into the diagnosis, treatment and personalization of AI medical therapies. Designed by experts in this field, the curriculum will delve into pattern recognition and *Machine Learning* for medical assessment. The syllabus will also delve into assisted treatment systems, taking into account machine learning algorithms for the establishment of therapeutic processes. The materials will also analyze the applications of intelligent automation in fields such as pharmacogenomics. In addition, the program will enable physicians to master the design of personalized therapies based on the needs of their patients.

Enjoy the most up-to-date medical-scientific content on the educational scene without time restrictions or unnecessary trips to a study center"

Module 1. Diagnosis in Clinical Practice Using Artificial Intelligence

1.1.   Technologies and Tools for AI-assisted Diagnosis

    1.1.1.   Development of Software for AI-assisted Diagnosis in Various Medical Specialties

    1.1.2.   Use of Advanced Algorithms for Rapid and Accurate Analysis of Clinical Symptoms and Signs

    1.1.3.   Integration of AI in Diagnostic Devices to Improve Efficiency

    1.1.4.   AI Tools to Assist in the Interpretation of Laboratory Test Results

1.2.   Integration of Multimodal Clinical Data for Diagnosis

    1.2.1.   AI Systems for Combining Imaging, Laboratory, and Clinical Record Data

    1.2.2.   Tools for Correlating Multimodality Data into More Accurate Diagnoses

    1.2.3.   Use of AI to Analyze Complex Patterns from Different Types of Clinical Data

    1.2.4.   Integration of Genomic and Molecular Data in AI-assisted Diagnosis

1.3.   Creation and Analysis of Health Datasets with AI

    1.3.1.   Development of Clinical Databases for Training AI Models

    1.3.2.   Use of AI for Analysis and Extraction of Insights from Large Health Datasets

    1.3.3.   AI Tools for Clinical Data Cleaning and Preparation

    1.3.4.   AI Systems for Identifying Trends and Patterns in Health Data

1.4.   Visualization and Management of Health Data with AI

    1.4.1.   AI Tools for Interactive and Understandable Visualization of Health Data

    1.4.2.   AI Systems for Efficient Management of Large Volumes of Clinical Data

    1.4.3.   Use of AI-based Dashboards for Monitoring of Health Indicators

    1.4.4.   AI Technologies for Health Data Management and Security

1.5.   Pattern Recognition and Machine Learning in Clinical Diagnostics

    1.5.1.   Application of Machine Learning Techniques for Pattern Recognition in Clinical Data

    1.5.2.   Use of AI in the Early Identification of Diseases through Pattern Analysis

    1.5.3.   Development of Predictive Models for More Accurate Diagnoses

    1.5.4.   Implementation of Automatic Learning Algorithms in the Interpretation of Health Data

1.6.   Interpretation of Medical Images Using AI

    1.6.1.   AI Systems for Anomaly Detection and Classification of Medical Image Anomalies

    1.6.2.   Use of Deep Learning in the interpretation of X-rays, MRI and CT scans

    1.6.3.   AI Tools for Improving Accuracy and Speed in Diagnostic Imaging

    1.6.4.   Implementation of AI for Image-Based Clinical Decision-Making Assistance

1.7.   Natural Language Processing on Medical Records for Clinical Diagnosis

    1.7.1.   Use of NLP for the Extraction of Relevant Information from Medical Records

    1.7.2.   AI Systems for Analyzing Physician Notes and Patient Reports

    1.7.3.   AI Tools for Summarizing and Classifying Information from Medical Records

    1.7.4.   Application of NLP in Identifying Symptoms and Diagnoses from Clinical Texts

1.8.   Validation and Evaluation of AI-assisted Diagnostic Models

    1.8.1.   Methods for Validation and Testing of AI Models in Real Clinical Environments

    1.8.2.   Evaluation of the Performance and Accuracy of AI-assisted Diagnostic Tools

    1.8.3.   Use of AI to Ensure Reliability and Ethics in Clinical Diagnosis

    1.8.4.   Implementation of Continuous Assessment Protocols for AI Systems in Health Care

1.9.   AI in the Diagnosis of Rare Diseases

    1.9.1.   Development of AI Systems Specializing in the Identification of Rare Diseases

    1.9.2.   Use of AI to Analyze Atypical Patterns and Complex Symptomatology

    1.9.3.   AI Tools for Early and Accurate Diagnosis of Rare Diseases

    1.9.4.   Implementation of Global Databases with AI to Improve Diagnosis of Rare Diseases

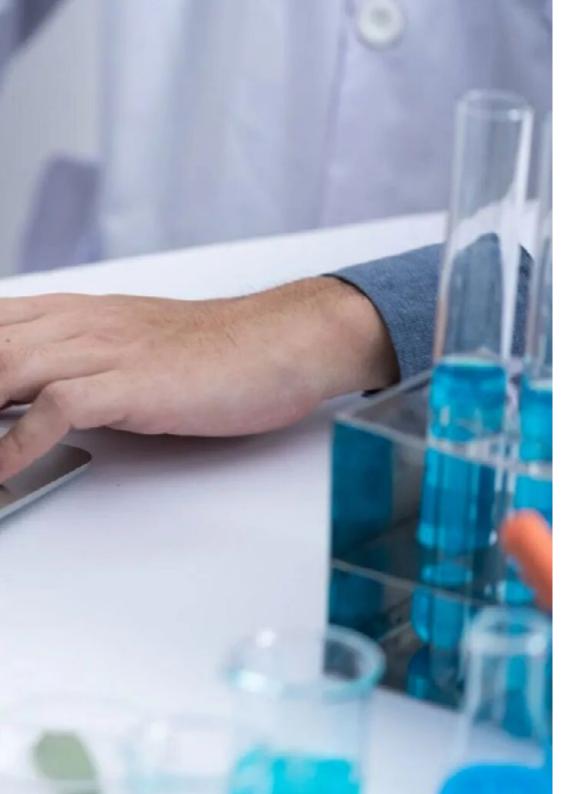## Module 2. Treatment and Management of the Artificial Intelligence Patient

Module 3. Health Personalization through Artificial Intelligence

3.1.   AI Applications in Genomics for Personalized Medicine

    3.1.1.   Development of AI Algorithms for the Analysis of Genetic Sequences and their Relationship to Diseases

    3.1.2.   Use of AI in the Identification of Genetic Markers for Personalized Treatments

    3.1.3.   Implementation of AI for the Rapid and Accurate Interpretation of Genomic Data

    3.1.4.   AI Tools in Correlating Genotypes with Drug Responses

3.2.   AI in Pharmacogenomics and Drug Design

    3.2.1.   Development of AI Models for Predicting Drug Efficacy and Safety

    3.2.2.   Use of AI in the Identification of Therapeutic Targets and Drug Design

3.2.3.   Application of AI in the Analysis of Gene-Drug Interactions for Personalization of Treatments

    3.2.4.   Implementation of AI Algorithms to Accelerate New Drug Discovery

3.3.   Personalized Monitoring with Smart Devices and AI

    3.3.1.   Development of Wearables with AI for Continuous Monitoring of Health Indicators

    3.3.2.   Use of AI in the Interpretation of Data Collected by Smart Devices

    3.3.3.   Implementation of AI-based Early Warning Systems for Health Conditions

    3.3.4.   AI Tools for Personalization of Lifestyle and Health Recommendations

3.4.   Clinical Decision Support Systems with AI

    3.4.1.   Implementation of AI to Assist Clinicians in Clinical Decision Support Systems

    3.4.2.   Development of AI Systems that Provide Clinical Data-Based Recommendations

    3.4.3.   Use of AI in Risk/Benefit Assessment of Different Therapeutic Options

    3.4.4.   AI tools for the Integration and Analysis of Real-Time Healthcare Data

With the best-rated study aids in online teaching, this program will allow you to make unstoppable progress in your professional growth"

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 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.

01 learning from evidence

02 relearning from evidence

03 testing

04 learning from an expert

05 neurocognitive context dependent learning

06 Von-Restorff effect

07 case based learning through storytelling

08 competencies testing (retesting)

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.

30%

10%

8%

20%

25%

4%

3%

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.

Certificate

The Postgraduate Diploma in Diagnosis, Treatment and Personalization of Medical Treatment with Artificial Intelligence guarantees students, in addition to the most rigorous and up-to-date education, access to a qualification issued by TECH Global University.

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

This program will allow you to obtain your **Postgraduate Diploma in Diagnosis, Treatment and Personalization of Medical Treatment with Artificial Intelligence** 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 Diagnosis, Treatment and Personalization of Medical Treatment with Artificial Intelligence**

Modality: **online**

Duration: **6 months**

Accreditation: **18 ECTS**

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tech. global university

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

Postgraduate Diploma in Diagnosis, Treatment and Personalization of Medical Treatment with Artificial Intelligence

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

Dr. Pedro Navarro Illana
Rector

Unique TECH Code: AFWORD23S   techtitute.com/certificates

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*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.

tech global university

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