Postgraduate Certificate

Artificial Intelligence-Enhanced Clinical Diagnostics

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Postgraduate Certificate

Artificial Intelligence-Enhanced Clinical Diagnostics

- 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/artificial-intelligence-enhaced-clinical-diagnostics**

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01

Introduction

Marfan syndrome affects 1 in 5,000 people worldwide. This disease, which damages the connective tissue, has become one of the rare pathologies with the highest global prevalence. Professionals face obstacles to its diagnosis, given its confusing characteristics. This slows down the initiation of treatments, while patients could suffer serious cardiovascular complications. Given this, Artificial Intelligence is of great use in detecting this and other rare conditions, by analyzing large amounts of data and detecting patterns that could go unnoticed by experts. For this reason, TECH develops this program for doctors, in 100% online mode, that delves into *Machine Learning* tools to make the most accurate clinical diagnoses.

A 100% online syllabus that allows you, through case studies, to delve into the most disruptive diagnostic functions of AI tools"

Emerging technologies in the healthcare field have opened new horizons for addressing conditions such as Cancer, Alzheimer's or Diabetes. These cutting-edge tools improve diagnostic accuracy while helping to identify the most appropriate treatment options for patients based on their genetic profile, medical history or demographics. In this way, specialists focus their work on the design of personalized therapies to achieve more effective results and minimize the side effects they may entail. However, to achieve this, physicians need to constantly update their knowledge in order to apply the most innovative procedures in their clinical practice.

To respond to this need, TECH has implemented a Postgraduate Certificate that covers the applications of Artificial Intelligence (AI) in the healthcare context. Designed by real experts in the field, the syllabus includes from the integration of multimodal clinical data to the development of datasets and management of the information obtained. The syllabus also delves into the process of evaluating diagnostic models assisted by Intelligent Automation. In addition, the physician can analyze real clinical cases and evaluate effective care strategies. In this way, the graduates of this program achieve an exhaustive mastery of the challenges related to these medical innovations, enabling them to achieve excellent healthcare practice.

The 100% online educational experience of this Postgraduate Certificate provides professionals with the flexibility to take it at the place and time of their choice. This university program does not include pre-established schedules or face-to-face classes, avoiding unnecessary trips to a study center. To complete this academic itinerary, all you need is a device with an Internet connection. On the other hand, TECH is characterized by an innovative learning methodology: Relearning. This teaching method involves the repetition of key concepts to ensure optimal assimilation of the contents in a natural and progressive way.

This **Postgraduate Certificate in Artificial Intelligence-Enhanced Clinical Diagnostics** contains the most complete and up-to-date scientific program on the market
Its most outstanding features are:

- The development of case studies presented by experts in Artificial Intelligence in Clinical Practice
- The graphic, schematic, and practical content 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

You will process natural language on medical records to make the most accurate clinical diagnoses after completing this 6-week program"

Thanks to the innovative Relearning methodology, of which TECH is a pioneer, you will integrate all the knowledge in an optimal way to successfully achieve the results you are looking for"

You will create datasets that will help you to discover risk factors and develop new therapeutic treatments through this program.

Do you want to specialize in the interpretation of medical images through Intelligent Automation? Achieve it through this exclusive syllabus.

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 university program, physicians will develop the skills to apply the most revolutionary AI techniques in their practice. They will be highly qualified to perform assisted diagnosis, clinical image analysis and even interpretation of model results. In addition, graduates will enhance their critical thinking to consider the benefits, limitations and possible errors of computational intelligence. Moreover, they will foster multidisciplinary collaboration by promoting a comprehensive understanding of how different healthcare areas successfully contribute to implementing individualized therapies to improve patient care.

This program merges clinical excellence with the technological revolution of Artificial Intelligence. You will be at the forefront of this innovative area of Medicine!"

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

- Critically analyze the benefits and limitations of AI in healthcare
- 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 context, focusing on aspects such as assisted diagnosis, analysis of medical images and interpretation of results
- Identify possible errors in the application of AI in healthcare, providing an informed view of its use in clinical settings

You will increase your confidence in clinical decision making by updating your knowledge through this comprehensive program"

03

Course Management

In its firm objective of providing the highest educational excellence, TECH has a first class teaching staff. These professionals have extensive work experience, which has allowed them to join the teams of prestigious hospitals. Therefore, the syllabus is characterized by having the most updated and complete contents in Artificial Intelligence-Enhanced Clinical Diagnosis. In addition, they provide students with the most advanced technological tools to contribute to the well-being of their patients and analyze future trends, encouraging students to develop innovation processes.

You will have the help of experts in the area of Artificial Intelligence-Enhanced Clinical Diagnosis to offer a more personalized medical care"

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 Granada 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 Postgraduate Certificate will provide a comprehensive view on the application of AI in the field of health. To achieve this, the syllabus will offer the most modern technological tools oriented to diagnosis assisted by computational cognition. Likewise, the syllabus will delve into pattern recognition and Machine Learning in order to classify diseases appropriately. The values, weaknesses and possible errors in the application of AI will also be analyzed. Throughout the program, the contents will highlight the importance of multidisciplinary collaboration to provide users with services based on clinical excellence.

You will master the most advanced technological tools for AI-assisted diagnosis, among which Machine Learning and high resolution images stand out"

Module 1. Diagnosis in Clinical Practice using AI

1.1. Technologies and Tools for AI-assisted Diagnostics
- 1.1.1. Development of Software for AI-assisted Diagnosis in Different 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 into 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 to Combine Imaging, Laboratory, and Clinical Record Data
- 1.2.2. Tools for Correlating Multimodal 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 AI Model Training
- 1.3.2. Use of AI for the 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 the 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 Machine Learning Algorithms in the Interpretation of Health Data

1.6. Interpretation of Medical Images using AI
- 1.6.1. AI Systems for Detection and Classification of Medical Image Anomalies
- 1.6.2. Use of Deep Learning in the Interpretation of X-rays, MRIs and CT Scans
- 1.6.3. AI Tools to Improve Accuracy and Speed in Diagnostic Imaging
- 1.6.4. Implementation of AI for Image-based Clinical Decision Support

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 Medical Record Information
- 1.7.4. Application of NLP in the Identification of Symptoms and Diagnosis 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 Settings
- 1.8.2. Performance and Accuracy Evaluation 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 Healthcare

1.9. AI in the Diagnosis of Rare Diseases
- 1.9.1. Development of AI Systems Specialized in Rare Diseases Identification
- 1.9.2. Use of AI for Analyzing 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

1.10. Success Stories and Challenges in AI Diagnostics Implementation
- 1.10.1. Analysis of Case Studies where AI has Significantly Improved Clinical Diagnosis
- 1.10.2. Assessment of Challenges in AI adoption in Clinical Settings
- 1.10.3. Discussion on Ethical and Practical Barriers in the Implementation of AI for Diagnosis
- 1.10.4. Examination of Strategies for Overcoming Obstacles to the Integration of AI in Medical Diagnostics

05

Methodology

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

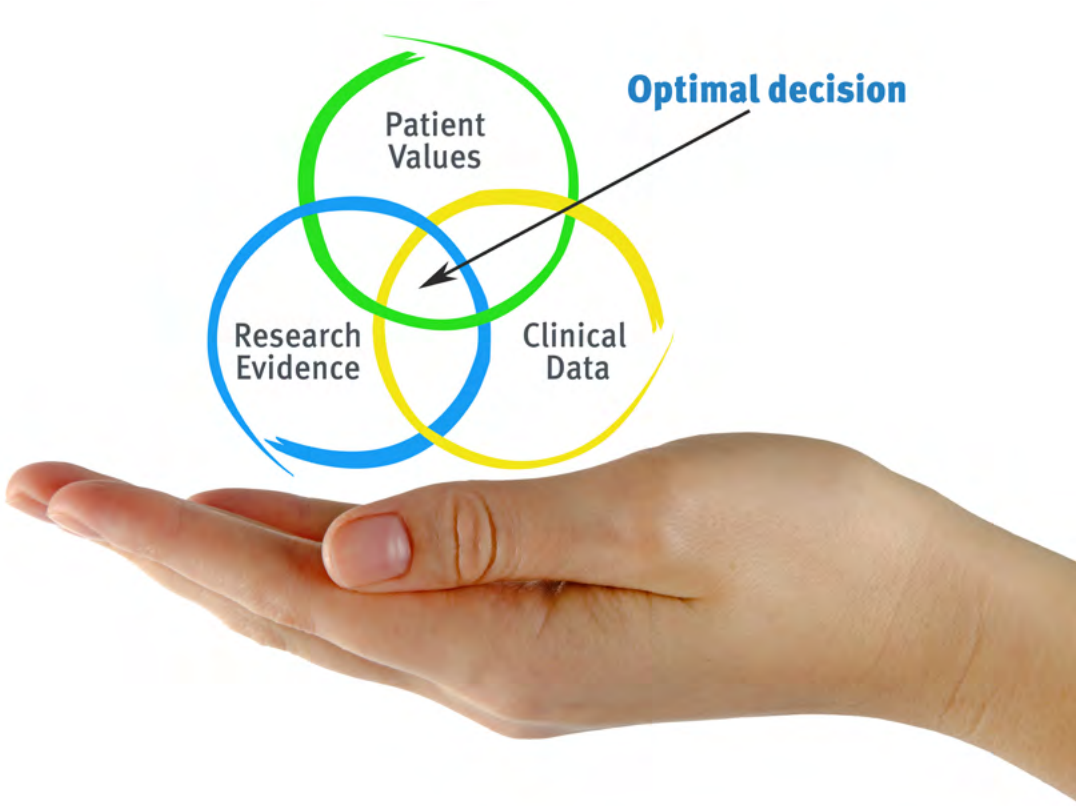
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

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:

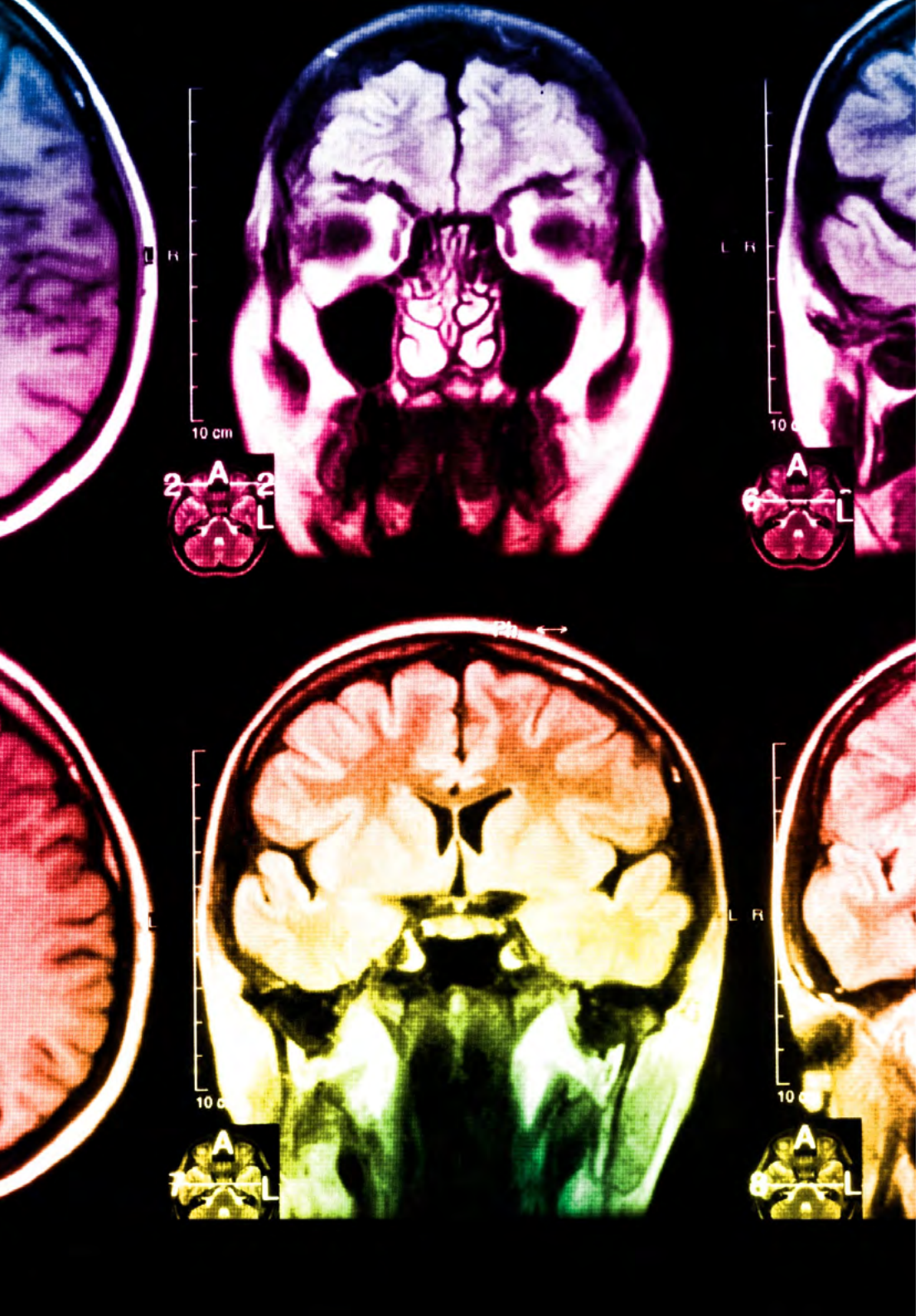
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better 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.

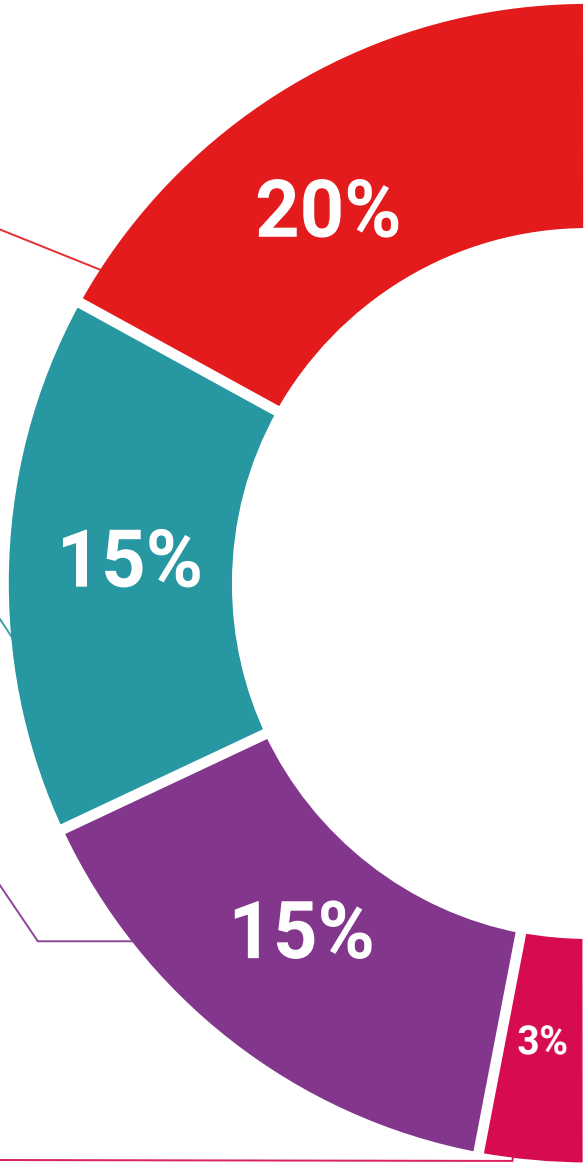
Interactive Summaries

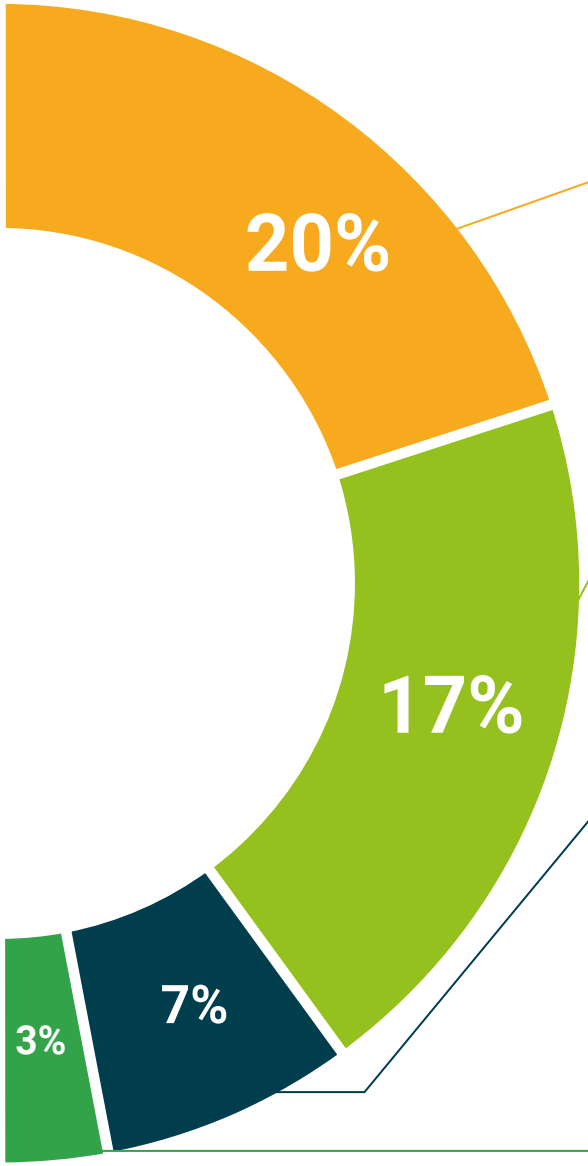
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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 Artificial Intelligence-Enhanced Clinical Diagnostics guarantees students, 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 Artificial Intelligence-Enhanced Clinical Diagnostics** contains the most complete and up-to-date scientific program 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 Artificial Intelligence-Enhanced Clinical Diagnostics**

Official Nº of Hours: **150 h.**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Awards the following

CERTIFICATE

to

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

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Artificial Intelligence-Enhanced Clinical Diagnostics

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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Postgraduate Certificate

Artificial Intelligence-Enhanced Clinical Diagnostics

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