Postgraduate Certificate

Artificial Intelligence Innovations in Diagnostic Imaging

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Postgraduate Certificate
Artificial Intelligence Innovations in Diagnostic Imaging

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Global University**
- Accreditation: **6 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/artificial-intelligence/postgraduate-certificate/artificial-intelligence-innovations-diagnostic-imaging**

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Introduction

The growing adoption of Artificial Intelligence in Diagnostic Imaging is transforming the field of Radiology, providing tools that help physicians detect diseases faster and more accurately. For example, these emerging instruments make it possible for specialists to identify Lung Lesions and Cardiovascular Diseases early, therefore significantly reducing diagnosis times. However, to enjoy their benefits, specialists need to develop advanced competencies to effectively manage AI-based solutions to optimize their clinical examinations. Therefore, TECH presents a pioneering university program focused on Artificial Intelligence Innovations in Diagnostic Imaging. In addition, it is delivered in a flexible 100% online modality.

Through this Relearning based Postgraduate Certificate, you will master the most innovative techniques of Artificial Intelligence to identify early Neurological Diseases from medical images"

A recent report carried out by the World Health Organization shows that the use of Artificial Intelligence in the interpretation of medical images can reduce by 30% the diagnostic errors in complex pathologies such as Cancer or Cardiovascular Diseases, therefore significantly improving clinical outcomes. In this scenario, professionals must stay at the forefront of the latest advances in this field to optimize patient care considerably and identify a wide range of diseases early.

In this context, TECH designs an exclusive program in Artificial Intelligence Innovations in Diagnostic Imaging. Conceived by references in this field, the academic itinerary will delve into factors ranging from image segmentation algorithms or applications of Artificial Intelligence in Interventional Cardiology to the extraction of clinical features from ultrasound images. In line with this, the study plan will analyze the latest trends in natural language processing in medical image documentation and reporting with Nuance PowerScribe 360. Likewise, the didactic materials will offer the most avant-garde techniques for the follow-up of Chronic Diseases. In this way, graduates will acquire clinical skills to apply tools such as Deep Learning, Convolutional Neural Networks or Deep Learning for the diagnosis of conditions.

In addition, the university program will be based on the disruptive Relearning system powered by TECH and will be accompanied by a variety of multimedia resources, complementary readings and videos in detail. All this from a flexible methodology, which does not follow strict schedules, so that physicians can adjust the academic update to their other professional responsibilities. Along the same lines, all graduates will need is an electronic device with Internet access to immerse themselves in the Virtual Campus and enjoy the most up-to-date teaching materials available on the educational market.

This **Postgraduate Certificate in Artificial Intelligence Innovations in Diagnostic Imaging** 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
- The graphic, schematic and eminently practical contents with which it is conceived gather scientific and practical information on those disciplines that are indispensable 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

A university program that gives you the opportunity to update your knowledge in a real scenario, with the maximum scientific rigor of an institution at the forefront of technology"

Are you looking to develop customized algorithms for automatic diagnosis and disease prediction using medical images? Achieve it with this program in just 6 weeks"

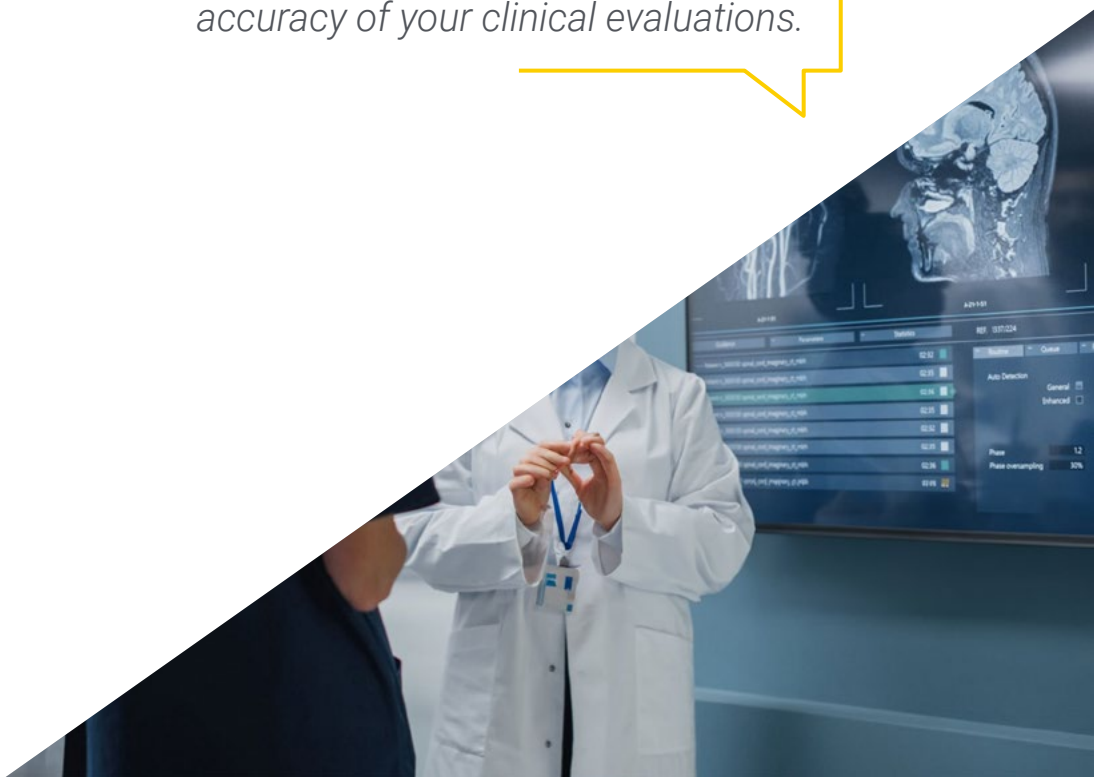
You will achieve your academic goals comfortably, without unnecessary trips to a study center thanks to TECH's 100% online methodology.

You will delve into the automatic generation of radiological reports, which will allow you to improve the accuracy of your clinical evaluations.

The program's teaching staff includes professionals from the field 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, students will be assisted by an innovative interactive video system created by renowned and experienced experts.



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Objectives

Through this Postgraduate Certificate, physicians will handle the most innovative technologies of Artificial Intelligence for the processing and analysis of medical images. In this way, specialists will detect anomalies that will allow them to detect early a wide variety of pathologies such as cancer. In this sense, professionals will develop advanced clinical skills to handle tools such as Deep Learning or Convolutional Neural Networks. Likewise, graduates will implement Machine Learning and Deep Learning models for the analysis of large volumes of medical image data.

You will implement the most cutting-edge Deep Learning models for the analysis of large volumes of medical image data"

General Objectives

- Understand the theoretical foundations of Artificial Intelligence
- Study the different types of data and understand the data life cycle
- 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
- Explore bio-inspired computing and its relevance in the development of intelligent systems
- Develop skills to use and apply advanced Artificial Intelligence tools in the interpretation and analysis of medical images, improving diagnostic accuracy
- Implement Artificial Intelligence solutions that allow the automation of processes and the personalization of diagnostics
- Apply Data Mining and Predictive Analytics techniques to make evidence-based clinical decisions
- Acquire research skills that allow experts to contribute to the advancement of Artificial Intelligence in medical imaging

Specific Objectives

- Master tools such as IBM Watson Imaging and NVIDIA Clara to automatically interpret clinical tests
- Gain competencies to perform clinical experiments and results analysis using Artificial Intelligence, with an approach based on improving diagnostic accuracy

Specialized readings will allow you to further expand on the rigorous information provided in this academic proposal"

03

Course Management

In its commitment to offer the most complete and updated university programs in the pedagogical panorama, TECH carries out a meticulous process to conform its teaching staff. For the delivery of this Postgraduate Certificate, TECH has enlisted the services of the best specialists in the field of Artificial Intelligence Innovations in Diagnostic Imaging. These professionals have elaborated a myriad of didactic contents that stand out for their excellent quality and for adjusting to the demands of the current labor market. In this way, graduates will enter into an intensive experience that will allow them to significantly optimize their daily clinical practice.

You will have access to a syllabus designed by authentic references in Artificial Intelligence Innovations in Diagnostic Imaging"

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
- PhD. in Psychology from the University of Castilla La Mancha
- PhD in Economics, Business and Finance from the Camilo José Cela University
- PhD 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

Professors

Mr. Popescu Radu, Daniel Vasile

- Independent Specialist in Pharmacology, Nutrition and Dietetics
- Freelance Producer of Teaching and Scientific Content
- Nutritionist and Community Dietitian
- Community Pharmacist
- Researcher
- Master's Degree in Nutrition and Health at the Open University of Catalonia
- Master's Degree in Psychopharmacology from the University of Valencia
- Pharmacist from the Complutense University of Madrid
- Nutritionist-Dietitian by 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"

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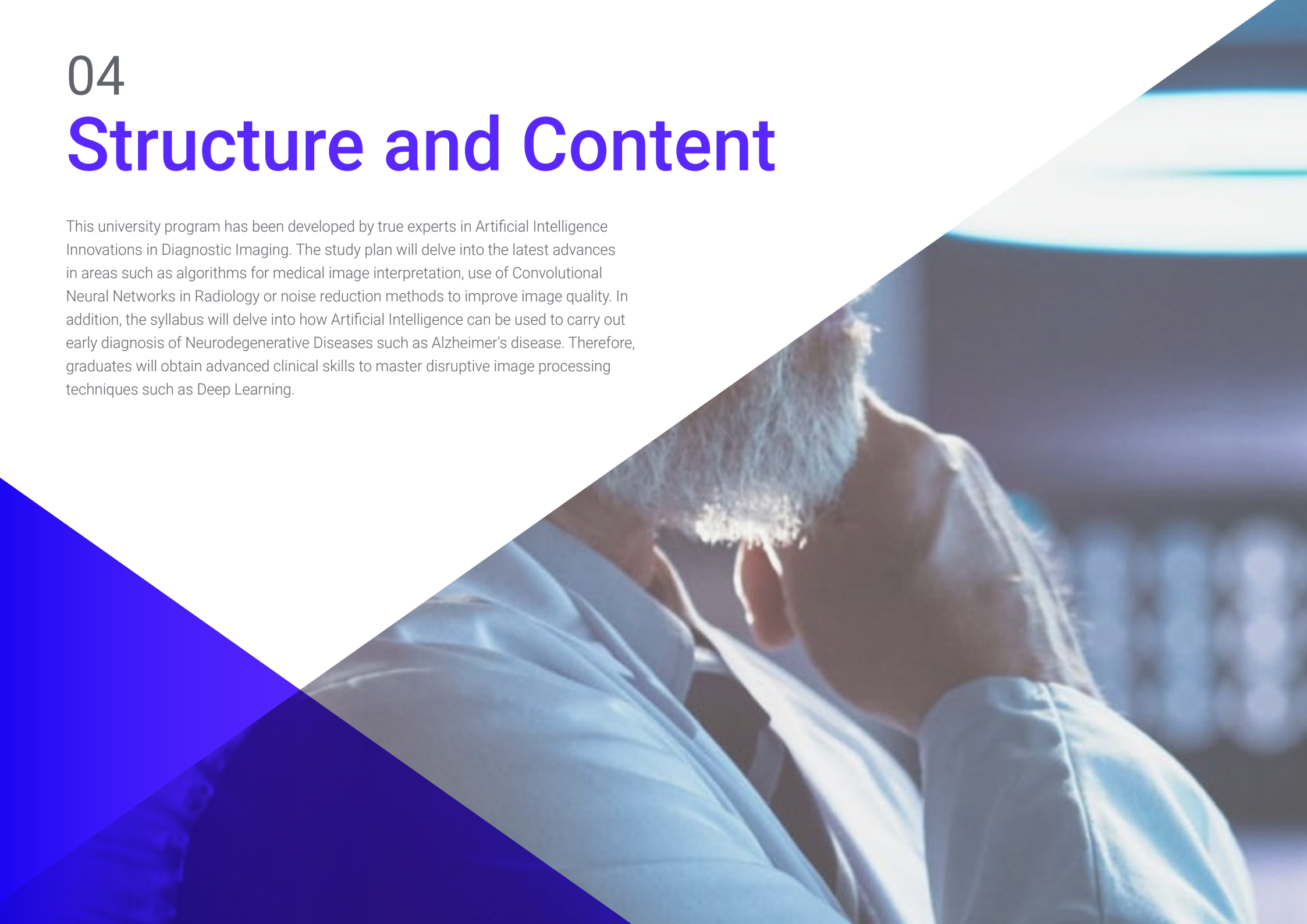
Structure and Content

This university program has been developed by true experts in Artificial Intelligence Innovations in Diagnostic Imaging. The study plan will delve into the latest advances in areas such as algorithms for medical image interpretation, use of Convolutional Neural Networks in Radiology or noise reduction methods to improve image quality. In addition, the syllabus will delve into how Artificial Intelligence can be used to carry out early diagnosis of Neurodegenerative Diseases such as Alzheimer's disease. Therefore, graduates will obtain advanced clinical skills to master disruptive image processing techniques such as Deep Learning.



You will master advanced techniques such as Deep Learning or Convolutional Neural Networks to detect anomalies in medical images"

Module 1. Artificial Intelligence Innovations in Diagnostic Imaging

1.1. Artificial Intelligence Technologies and Tools in Diagnostic Imaging with IBM Watson Imaging Clinical Review
- 1.1.1. Leading Software Platforms for Medical Image Analysis
- 1.1.2. Radiology-Specific Deep Learning Tools
- 1.1.3. Innovations in Hardware to Accelerate Image Processing
- 1.1.4. Integration of Artificial Intelligence Systems in Existing Hospital Infrastructures

1.2. Statistical Methods and Algorithms for Medical Image Interpretation with DeepMind AI for Breast Cancer Analysis
- 1.2.1. Image Segmentation Algorithms
- 1.2.2. Classification and Detection Techniques in Medical Images
- 1.2.3. Use of Convolutional Neural Networks in Radiology
- 1.2.4. Noise Reduction and Image Quality Improvement Methods

1.3. Design of Experiments and Analysis of Results in Diagnostic Imaging with Google Cloud Healthcare API
- 1.3.1. Design of Validation Protocols for Artificial Intelligence Algorithms
- 1.3.2. Statistical Methods for Comparing the Performance of Artificial Intelligence and Radiologists
- 1.3.3. Setting Up Multicenter Studies for Artificial Intelligence Testing
- 1.3.4. Interpretation and Presentation of Performance Test Results

1.4. Detection of Subtle Patterns in Low-Resolution Images
- 1.4.1. Artificial Intelligence for Early Diagnosis of Neurodegenerative Diseases
- 1.4.2. Artificial Intelligence Applications in Interventional Cardiology
- 1.4.3. Use of Artificial Intelligence for the Optimization of Imaging Protocols

1.5. Biomedical Image Analysis and Processing
- 1.5.1. Pre-Processing Techniques to Improve Automatic Interpretation
- 1.5.2. Texture and Pattern Analysis in Histological Images
- 1.5.3. Extraction of Clinical Features from Ultrasound Images
- 1.5.4. Methods for Longitudinal Analysis of Images in Clinical Studies

1.6. Advanced Data Visualization in Diagnostic Imaging with OsiriX MD
- 1.6.1. Development of Graphical Interfaces for 3D Image Exploration
- 1.6.2. Tools for Visualization of Temporal Changes in Medical Images
- 1.6.3. Augmented Reality Techniques for the Teaching of Anatomy
- 1.6.4. Real-Time Visualization Systems for Surgical Procedures

1.7. Natural Language Processing in Medical Image Documentation and Reporting with Nuance PowerScribe 360
- 1.7.1. Automatic Generation of Radiological Reports
- 1.7.2. Extraction of Relevant Information from Electronic Medical Records
- 1.7.3. Semantic Analysis for the Correlation of Imaging and Clinical Findings
- 1.7.4. Image Search and Retrieval Tools Based on Textual Descriptions

1.8. Integration and Processing of Heterogeneous Data in Medical Imaging
- 1.8.1. Fusion of Imaging Modalities for Complete Diagnostics
- 1.8.2. Integration of Laboratory and Genetic Data in the Image Analysis
- 1.8.3. Systems for Handling Large Volumes of Imaging Data
- 1.8.4. Strategies for Normalization of Datasets from Multiple Sources

1.9. Applications of Neural Networks in Medical Image Interpretation with Zebra Medical Vision
- 1.9.1. Use of Generative Networks for the Creation of Synthetic Medical Images
- 1.9.2. Neural Networks for Automatic Tumor Classification
- 1.9.3. Deep Learning for the Analysis of Time Series in Functional Imaging
- 1.9.4. Fitting of Pre-Trained Models on Specific Medical Image Datasets

1.10. Predictive Modeling and its Impact on Diagnostic Imaging with IBM Watson Oncology
- 1.10.1. Predictive Models for Risk Assessment in Oncology Patients
- 1.10.2. Predictive Tools for Chronic Disease Follow-Up
- 1.10.3. Survival Analysis Using Medical Imaging Data
- 1.10.4. Prediction of Disease Progression using Machine Learning Techniques

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"

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

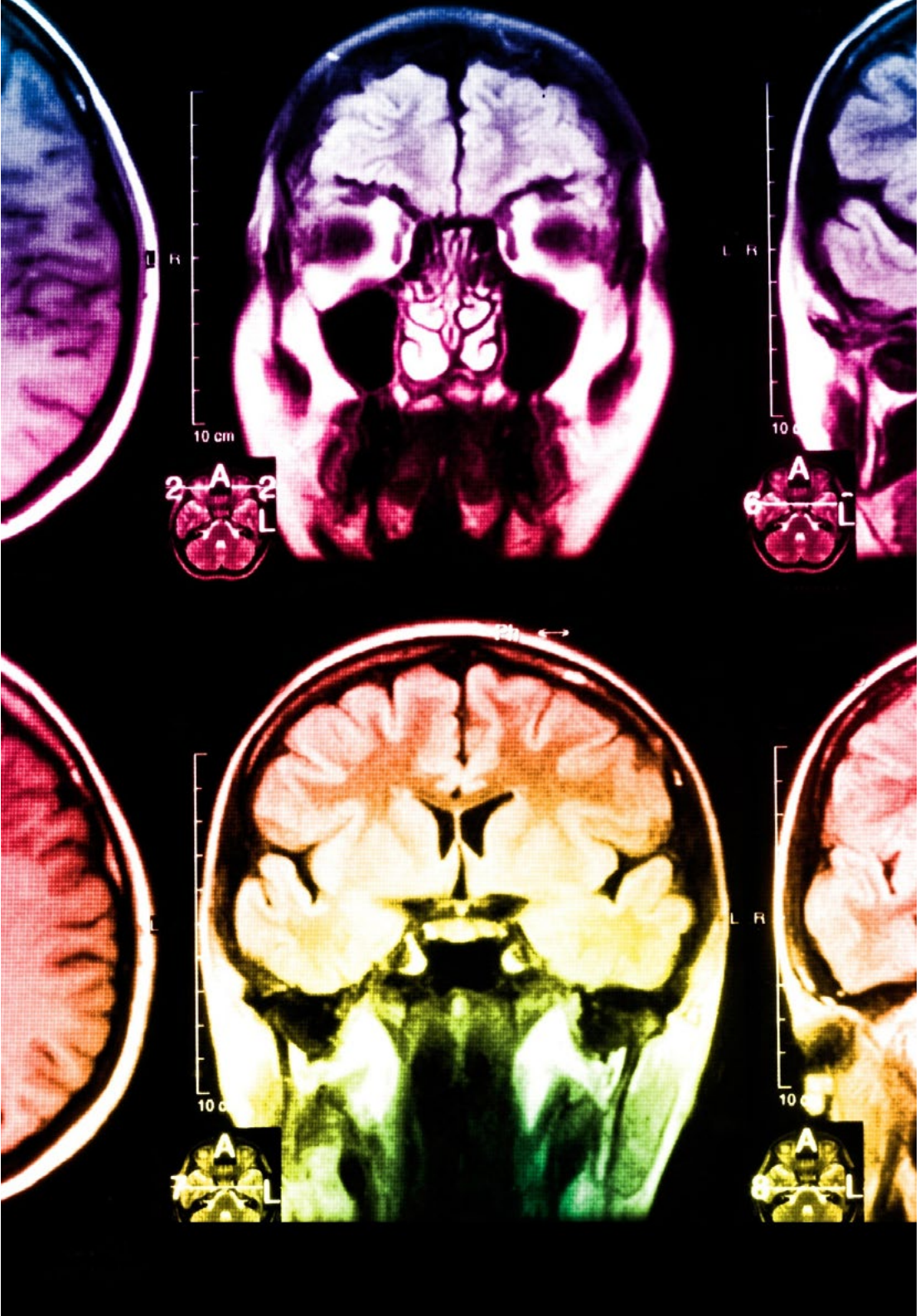
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.



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.

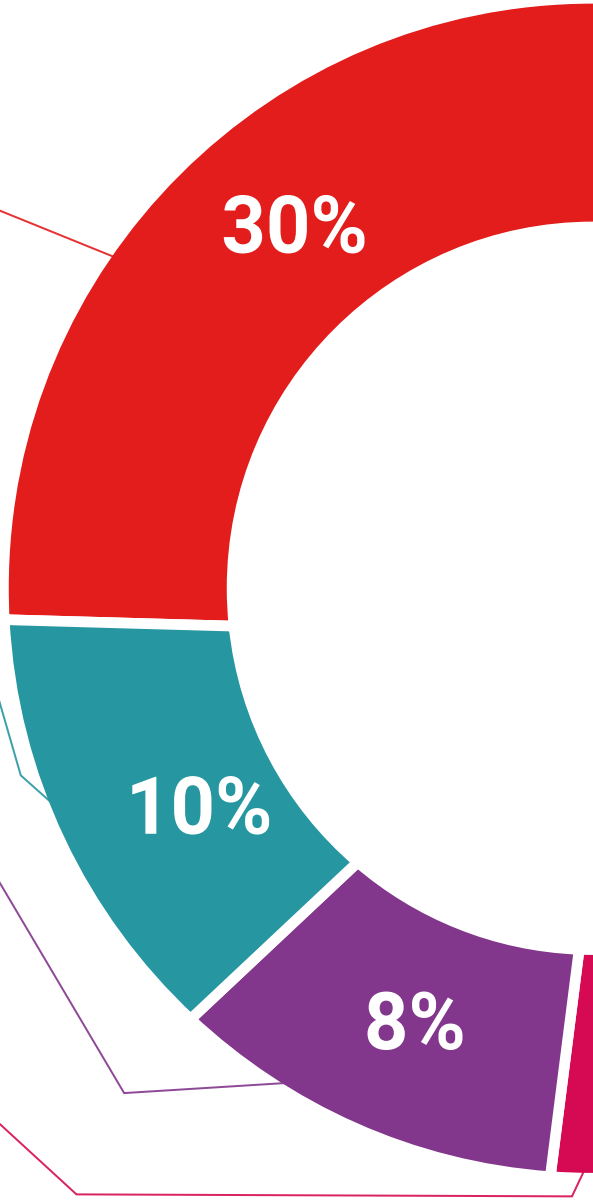
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

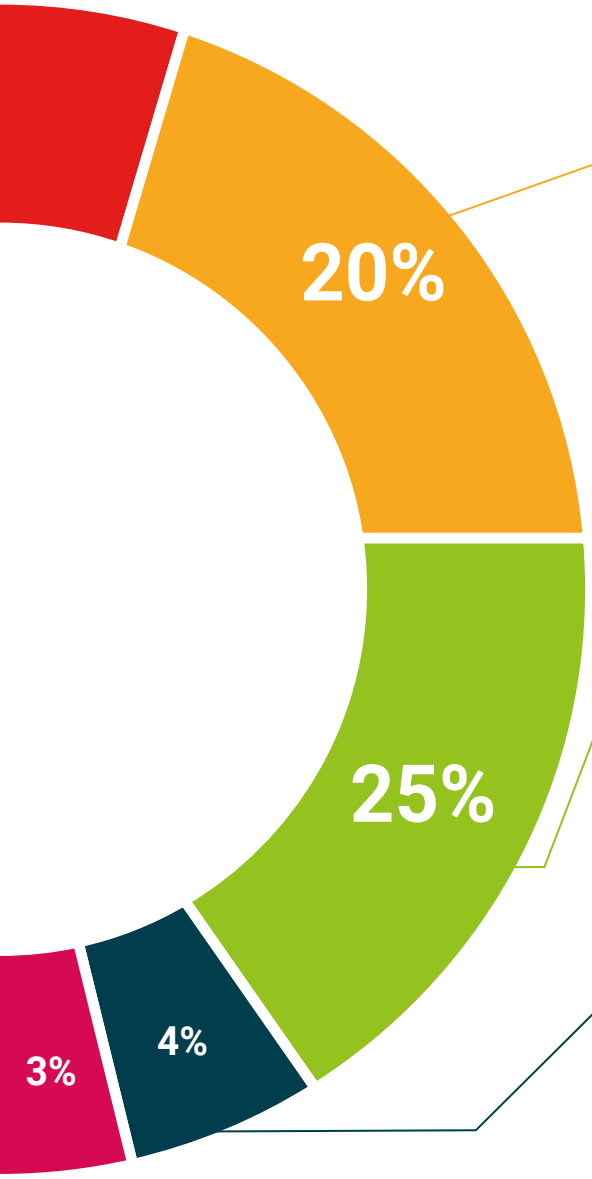
Practising Skills and Abilities

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.





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.

06

Certificate

The Postgraduate Certificate in Artificial Intelligence Innovations in Diagnostic Imaging guarantees, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

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

This private qualification will allow you to obtain a **Postgraduate Certificate in Artificial Intelligence Innovations in Diagnostic Imaging** 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** private qualification, 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 Certificate in Artificial Intelligence Innovations in Diagnostic Imaging**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

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

Postgraduate Certificate in Artificial Intelligence Innovations in Diagnostic Imaging

This is a private qualification of 180 hours of duration equivalent to 6 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
Dean

Unique TECH Code: AFWORD23S techtitute.com/certificates

*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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Artificial Intelligence Innovations in Diagnostic Imaging

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