

Postgraduate Certificate Radiophysics in Diagnostic Imaging





Postgraduate Certificate Radiophysics in Diagnostic Imaging

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

Website: www.techtute.com/us/engineering/postgraduate-certificate/radiophysics-diagnostic-imaging

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01

Introduction

The constant evolution of technologies, such as radiodiagnostic and computed tomography, has created an urgent need for expert engineers. In response to this growing demand for specialized professionals, this innovative university program was born to offer engineering professionals the opportunity to excel in the field of diagnostic imaging, an essential field in medical engineering. This specialization will offer a practical and theoretical approach to address the complexities of implementing and operating diagnostic imaging systems. It will also adapt to the dynamics of the current labour market, providing flexibility through a 100% online format, varied multimedia content and the effective *Relearning* methodology.





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Thanks to this Postgraduate Certificate, you will discover how the latest technological innovations are transforming the field of diagnostic imaging"

In today's imaging landscape, the increasing complexity of technologies and the demand for accurate and efficient results require advanced specialization by engineers. This pioneering syllabus is presented as an essential response to these needs, providing professionals with the unique opportunity to acquire specialized knowledge that will allow them to excel in the competitive field of medical engineering.

At the core of the syllabus of this Postgraduate Certificate in Radiophysics in Diagnostic Imaging, graduates will delve into various diagnostic imaging technologies, from radiodiagnosis to fluoroscopy and computed tomography. In addition, a detailed specialized knowledge will be developed on the operation of X-ray tubes and digital image detectors, allowing graduates to understand not only the theory, but also the practical application of these technologies in clinical environments.

Students will also analyze the different types of radiological, static and dynamic images, evaluating the advantages and disadvantages of the various available technologies and exploring international quality control protocols in radiology. Similarly, dosimetry of patients undergoing radiological testing will be a key component, ensuring that students are equipped to manage radiation exposure safely.

In terms of methodology, the program will adopt an innovative and flexible approach, being 100% online. With the addition of the *Relearning* methodology, based on the repetition of key concepts, will be used to fix knowledge and facilitate continuous learning. This combination of online accessibility and a participant-centered methodology will ensure that they can advance their specialization without disrupting their career, providing a complete educational experience tailored to their needs.

This **Postgraduate Certificate in Radiophysics in Diagnostic Imaging** contains the most complete and up-to-date program on the market. The most important features include:

- ♦ The development of practical cases presented by experts in Radiophysics in Diagnostic Imaging
- ♦ The graphic, schematic and practical contents with which it is conceived provide cutting- Therapeutics and practical information on those 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 apply cutting-edge technologies and ensure the optimal performance of equipment in the field of radio diagnosis, through 180 hours of the best digital teaching"

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You'll master the accurate generation of X-rays for detailed, high-precision imaging at the world's top-rated university by your students, according to the Trustpilot platform (4.9/5)"

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.

*Forget about memorizing!
With the Relearning system
you will integrate the concepts
in a natural and progressive way.*

*You will delve into the evaluation
and selection of the most efficient
technologies for specific applications
in the field of Medical Engineering.*



02

Objectives

The main objective of this innovative university program will be for graduates to acquire a deep knowledge and specialization in various diagnostic imaging technologies, such as radiodiagnostic, fluoroscopy or computed tomography. Through a practical and theoretical approach, engineers will develop crucial competencies to understand the particularities of these technologies and their clinical applications. The syllabus has been designed specifically for professionals to excel in the implementation and optimization of diagnostic imaging systems, contributing to the continuous advancement of Medical Engineering.





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You will achieve your objectives thanks to TECH's didactic tools, among which the explanatory videos and interactive summaries stand out"



General Objectives

- ♦ Develop the physical elements of obtaining X-ray beams and their interaction with matter in aspects that have to do with imaging
- ♦ Assess the most relevant technical characteristics of all equipment that can be used in a diagnostic facility
- ♦ Examine the role of quality assurance and quality control systems in the achievement of optimal diagnostic images
- ♦ Analyze the importance of radiation protection, both for professionals involved in radiological diagnostic facilities, and for patients themselves





Specific Objectives

- ◆ Develop specialized knowledge about the operation of an X-ray tube and a digital image detector
- ◆ Identify the different types of radiological images (static and dynamic), as well as the advantages and disadvantages offered by the various technologies available
- ◆ Analyze international quality control protocols for radiology equipment
- ◆ Delve into the fundamental aspects in the dosimetry of patients undergoing radiological tests

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TECH presents you a unique Postgraduate Certificate in its style, which will help you make a leap in your profession in just six weeks”

03

Course Management

This Postgraduate Certificate has an exceptional teaching body, composed of the best specialists in the field of Medical Engineering. TECH has brought together professionals with an extensive and recognized professional background, ensuring that students benefit from the experience and knowledge of leading experts. This teaching team is committed to providing graduates with the necessary tools to fully understand the complexities of imaging diagnosis, allowing them to excel in the field and contribute to the continuous advancement of this key discipline in the medical field.





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*You will learn from reference professionals,
the latest advances in procedures in the field
of advanced diagnostic imaging”*

Management



Dr. De Luis Pérez, Francisco Javier

- ♦ Specialist in Hospital Radiophysics
- ♦ Head of the Radiophysics and Radiological Protection Service at Quirónsalud Hospitals in Alicante, Torrevieja and Murcia
- ♦ Research Group in Personalized Multidisciplinary Oncology, Catholic University San Antonio of Murcia
- ♦ PhD in Applied Physics and Renewable Energies, University of Almeria
- ♦ Degree in Physical Sciences, specializing in Theoretical Physics, University of Granada
- ♦ Member of: Spanish Society of Medical Physics (SEFM), Royal Spanish Society of Physics (RSEF), Illustrious Official College of Physicists and Consulting and Contact Committee, Proton Therapy Center (Quirónsalud)

Professors

Dr. Rodríguez, Carlos Andrés

- ♦ Specialist in Hospital Radiophysics
- ♦ Physician in Hospital Radiophysics at the University Clinical Hospital of Valladolid, responsible for the Nuclear Medicine section
- ♦ Principal Tutor of residents of the Department of Radiophysics and Radiological Protection of the University Clinical Hospital of Valladolid
- ♦ Degree in Hospital Radiophysics
- ♦ Degree in Physics at the University of Salamanca



04

Structure and Content

Along this Postgraduate Certificate in Radiophysics in Diagnostic Imaging, engineers will dive into the universe of radiological images, exploring both static and dynamic. In addition, the program will detail in detail the advantages and disadvantages of the various technologies currently available, allowing professionals to acquire a deep and practical knowledge. From fundamental principles to advanced applications, the academic pathway will comprehensively address diagnostic imaging, providing students with the necessary tools to understand, evaluate and contribute to the continuous development of this medical discipline.

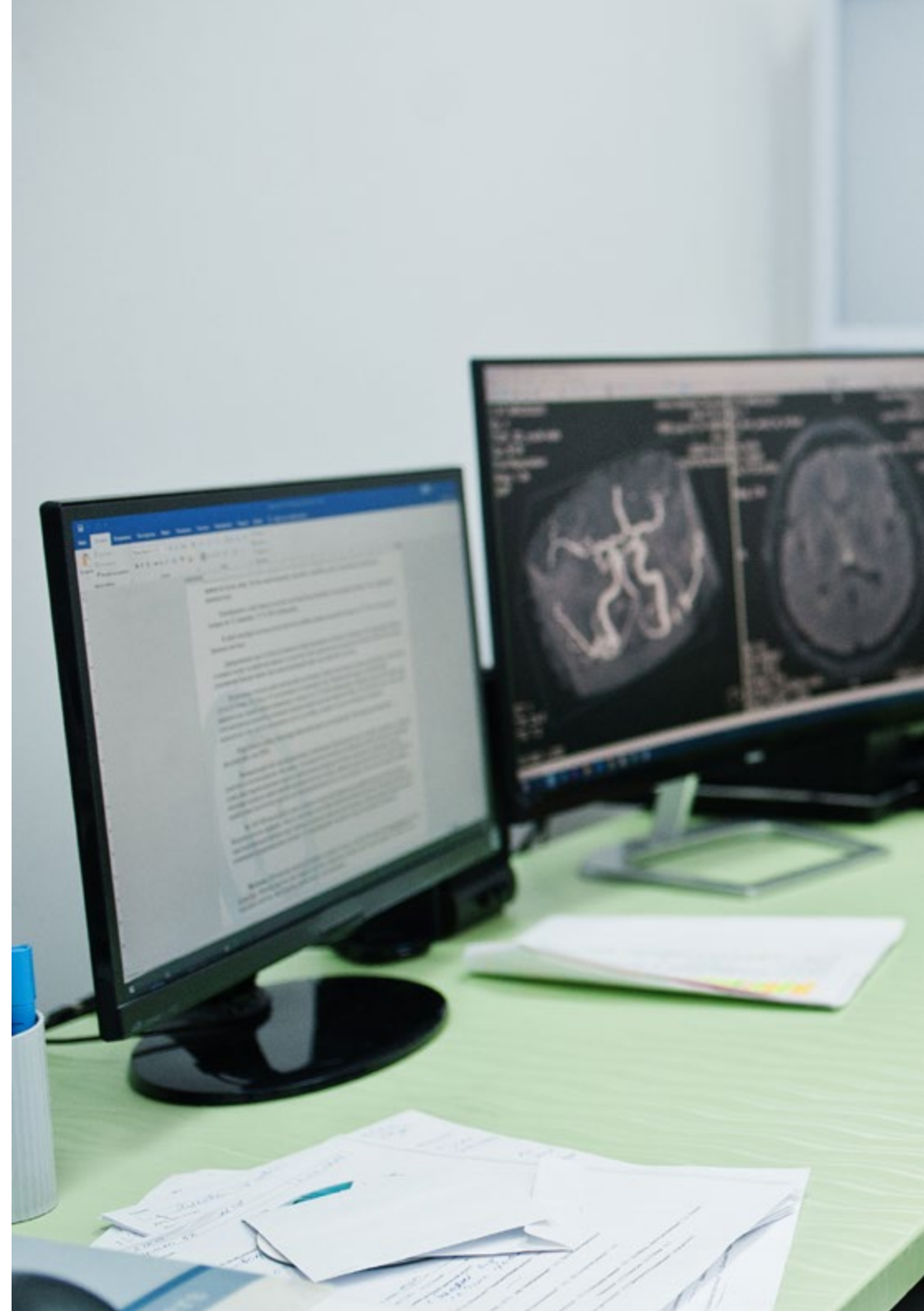


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Imaging techniques have evolved a lot in recent years. This program will give you access to their latest news"

Module 1. Advanced Diagnostic Imaging

- 1.1. Advanced Physics in X-Ray Generation
 - 1.1.1. X-Ray Tube
 - 1.1.2. Radiation Spectra Used in Radiodiagnosis
 - 1.1.3. Radiological Technique
- 1.2. Radiological Imaging
 - 1.2.1. Digital Image Recording Systems
 - 1.2.2. Dynamic Imaging
 - 1.2.3. Radiodiagnostic Equipment
- 1.3. Quality Control in Diagnostic Radiology
 - 1.3.1. Quality Assurance Program in Diagnostic Radiology
 - 1.3.2. Quality Protocols in Radiodiagnostics
 - 1.3.3. General Quality Control Checks
- 1.4. Patient Dose Estimation in X-Ray Installations
 - 1.4.1. Patient Dose Estimation in X-Ray Facilities
 - 1.4.2. Patient Dosimetry
 - 1.4.3. Diagnostic Dose Reference Levels
- 1.5. General Radiology Equipment
 - 1.5.1. General Radiology Equipment
 - 1.5.2. Specific Quality Control Tests
 - 1.5.3. Doses to Patients in General Radiology
- 1.6. Mammography Equipment
 - 1.6.1. Mammography Equipment
 - 1.6.2. Specific Quality Control Tests
 - 1.6.3. Mammography Patient Dose
- 1.7. Fluoroscopy Equipment. Vascular and Interventional Radiology
 - 1.7.1. Fluoroscopy Equipment
 - 1.7.2. Specific Quality Control Tests
 - 1.7.3. Doses to Interventional Patients





- 1.8. Computed Tomography Equipment
 - 1.8.1. Computed Tomography Equipment
 - 1.8.2. Specific Quality Control Tests
 - 1.8.3. Dose to CT Patients
- 1.9. Other Radiodiagnostic Equipment
 - 1.9.1. Other Radiodiagnostic Equipment
 - 1.9.2. Specific Quality Control Tests
 - 1.9.3. Non-Ionizing Radiation Equipment
- 1.10. Radiological Image Visualization Systems
 - 1.10.1. Digital Image Processing
 - 1.10.2. Calibration of Display Systems
 - 1.10.3. Quality Control of Display Systems



*100% online methodology
for a flexible and accessible
program for engineering
professionals"*

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.





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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 is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

In 2019, we obtained the best learning results of all online universities in the world.

At TECH, you will learn using a cutting-edge methodology designed to 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 Radiophysics in Diagnostic Imaging guarantees you, in addition to the most rigorous and updated training, access to a Executive Master's Degree issued by TECH Global University.





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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 Certificate in Radiophysics 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.

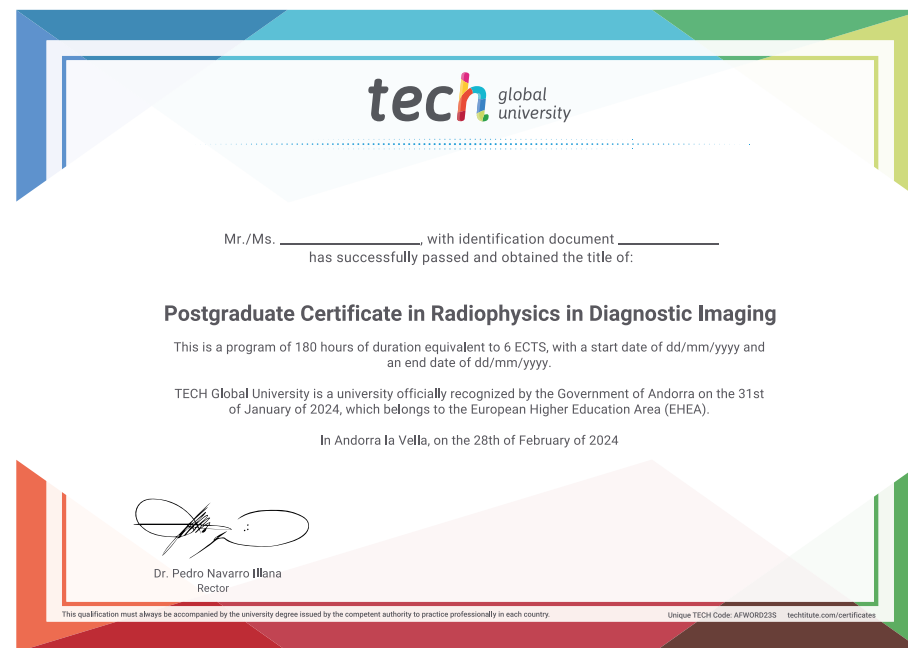
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Radiophysics in Diagnostic Imaging**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



future
health confidence people
education information tutors
guarantee accreditation teaching
institutions technology learning
community commitment
personalized service innovation
knowledge present
development language
virtual classroom



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