Postgraduate Certificate

Radiophysics in Diagnostic Imaging

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Postgraduate Certificate
Radiophysics in Diagnostic Imaging

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

Website: **www.techtitute.com/pk/nursing/postgraduate-certificate/radiophysics-diagnostic-imaging**

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01

Introduction

Technological progress has brought useful applications to the healthcare sector, among which Image Guided Radiotherapy stands out. This set of tools makes it possible to apply treatments against tumors with maximum precision while at the same time facilitating the planning and follow-up of therapeutic protocols and patients. In view of the advance of this equipment in hospital development, nursing staff must be highly specialized in the use of this type of equipment. That is why TECH has designed this study plan where the most sophisticated tools and the most advanced action strategies are analyzed. In addition, the university program has a convenient 100% online format, allowing students to expand their knowledge from home and on any portable device.

You will address dose reference levels and their usefulness for Radiodiagnostics with TECH, the world's best digital university according to Forbes"

Numerous tests involving the use of X-rays are performed around the world every year. However, the radiological risks associated with these health examinations are little known and often minimized by the general population and even by medical personnel. Nevertheless, the authorities that regulate the use of this technology continually issue strict regulations that allow greater control of resources and prevent the development of unnecessary or careless practices. Keeping abreast of updates to these protocols is essential for those who work in hospitals, especially nurses. These professionals face daily challenges such as patient management or radiobiological safety monitoring that require mastering the most contemporary guidelines in this field.

However, in order to keep up to date, nursing staff will encounter serious obstacles, including the scarcity of teaching materials based on the latest scientific evidence and the difficulty of combining their studies with their work obligations. For this reason, TECH has designed a program of studies that will put an end to these problems through its very complete syllabus. This curriculum will analyze the characteristics, advantages and disadvantages of equipment such as CT or Fluoroscopy equipment. Also, it will delve into aspects related to the implements and clinical conditions necessary for the adequate generation of X-rays.

On the other hand, the university program will be taught in a 100% online modality. This will make it possible for nurses to combine their studies with the rest of their daily duties. In addition, they will only need a device with Internet access to access the Virtual Campus and have access to high quality contents. They will also find in this digital environment a library full of multimedia resources, such as infographics or interactive summaries, which will strengthen their skills in a dynamic way.

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

- The development of case studies presented by experts in Radiophysics
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where the self-assessment process can be carried out to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

You will overcome emerging challenges in Diagnostic Imaging Radiophysics, continuously improving radiation safety in hospital facilities"

You will delve into the role of assurance systems in achieving optimal imaging for diagnostics following this TECH program"

You will delve into the characteristics of Fluoroscopy equipment through the exhaustive contents of this 6-week course.

Forget about memorizing! With the Relearning system, of which TECH is a pioneer, you will integrate the concepts in a natural and progressive way.

The program's teaching staff includes professionals from the sector who bring to this program the experience of their work, in addition to recognized specialists from prestigious reference societies and 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 university program will provide an immersive experience for nurses under the guidance of the best specialists in the radiological field. Upon completion, they will have acquired specialized knowledge about the operation of X-ray tubes and digital image detectors. In this way, they will actively participate in advanced therapeutic processes. In addition, they will incorporate the international protocols governing X-ray imaging systems into their professional practice.

You will update your knowledge on the implementation of the most complex Radiodiagnostic technologies"

General Objectives

- Analyze the basic interactions of ionizing radiation with tissues
- Establish the effects and risks of ionizing radiation at the cellular level
- Analyze elements of photon and electron beam measurement in external radiotherapy
- Examine the quality control program
- Identify the different planning techniques for external radiotherapy treatments
- Analyze the interactions of protons with matter
- Examine radiation protection and radiobiology in Proton Therapy
- Analyze the technology and equipment used in intraoperative radiation therapy
- Examine the clinical outcomes of Brachytherapy in different oncological contexts
- Analyze the importance of the Radiological Protection
- Assimilate the existing risks derived from the use of ionizing radiation
- Develop the international regulations applicable to radiation protection

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 currently available
- Analyze the international protocols for quality control of radiology equipment
- Delve into the fundamental aspects in the dosimetry of patients undergoing radiological tests

You will contribute to enhance diagnostic efficiency and safety in patient care through 150 hours of the best digital teaching"

03

Course Management

Nursing professionals have at their disposal in this Postgraduate Certificate a management and teaching staff that is a reference in its field and with professional prestige due to its excellent work in the process of Diagnostic Radiophysics in Diagnostic Imaging. Their advanced knowledge in this field is reflected in a syllabus that can be accessed by students 24 hours a day In addition, the proximity of the faculty will allow you to resolve any questions that may arise about the content of this program throughout the 6 weeks of this university education.

The main experts in Diagnostic Imaging have joined forces to share with you all their knowledge and years of experience in this area"

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, Universidad Católica San Antonio de 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, head of the Nuclear Medicine section
- Principal Tutor of residents of the Department of Radiophysics and Radiological Protection of the Hospital Clínico Universitario de Valladolid
- Degree in Hospital Radiophysics
- Degree in Physics at the University of Salamanca

04

Structure and Content

This academic pathway will analyze the physics underlying conventional Radiobiology. It will also delve into the generation of X-rays necessary to produce images and process them in such a way that they have diagnostic validity. The syllabus will provide students with the most modern technological tools to develop specific control tests that guarantee the quality of the graphic representations. For example, it will provide the keys to handle Mammography, Fluoroscopy or Radiobiology equipment. The program will also highlight the importance of complying with safety protocols in the event of radiation exposure by users and healthcare personnel.

You will master the advantages and disadvantages of the use of Computed Tomography in the health context thanks to this Postgraduate Certificate"

Module 1. Advanced Diagnostic Imaging

1.1. Advanced Physics in X-Ray Generation
- 1.1.1. X-ray Tubes
- 1.1.2. Radiation Spectra Used in Radiodiagnosis
- 1.1.3. Radiological Technique

1.2. Imaging in Radiology
- 1.2.1. Digital Image Recording Systems
- 1.2.2. Dynamic Imaging
- 1.2.3. Radiodiagnostic Equipment

1.3. Quality Control in Radiodiagnostics
- 1.3.1. Quality Assurance Program in Radiodiagnosis
- 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 Installations
- 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. Dose to Patients in Mammography

1.7. Fluoroscopy Equipment. Vascular and Interventional Radiology
- 1.7.1. Fluoroscopy Equipment
- 1.7.2. Specific Quality Control Tests
- 1.7.3. Dose to Patients in Interventions

1.8. Computed Tomography Equipment
- 1.8.1. Computed Tomography Equipment
- 1.8.2. Specific Quality Control Tests
- 1.8.3. Dose to Patients in CT

1.9. Other Radiodiagnostics Equipment
- 1.9.1. Other Radiodiagnostics 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 Visualization Systems

Prepare yourself to overcome the challenges of Radiodiagnostics present in Nursing units thanks to this 100% online university program"

05

Methodology

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

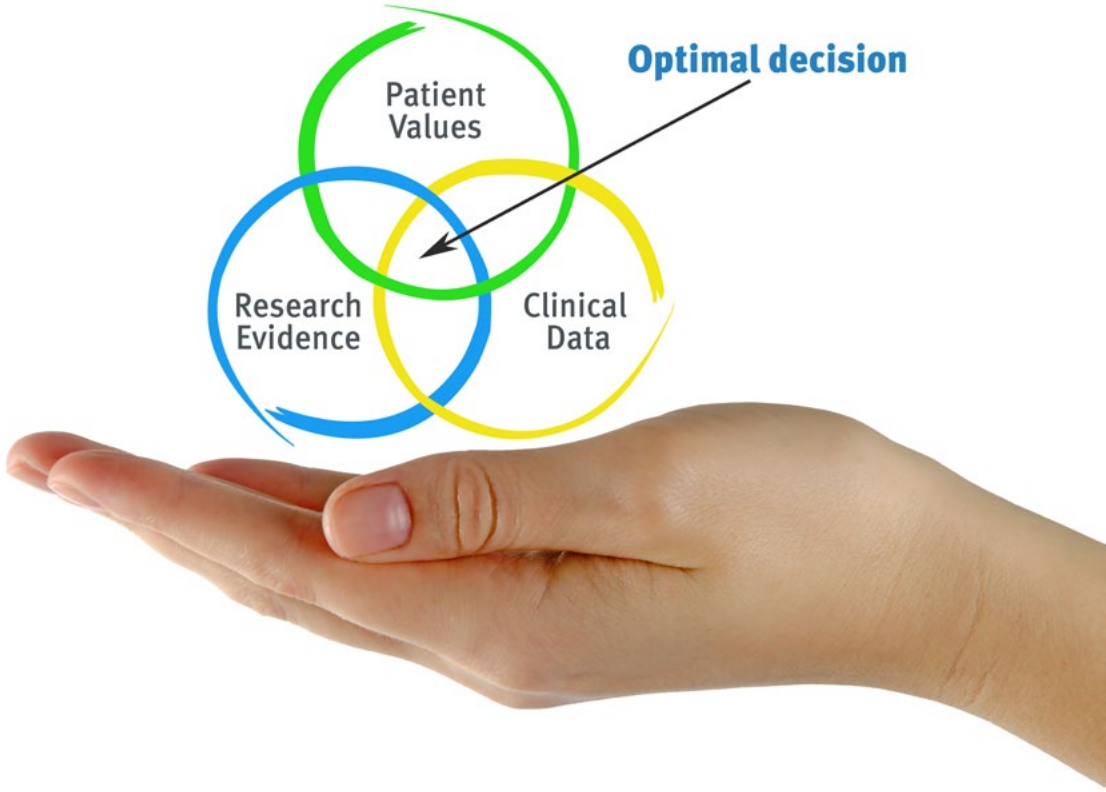
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

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 Nursing School we use the Case Method

In a given situation, what should a professional do? 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. Nurses learn better, faster, and more sustainably over time.

With TECH, nurses can experience a learning methodology 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, in an attempt to recreate the real conditions in professional nursing 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:

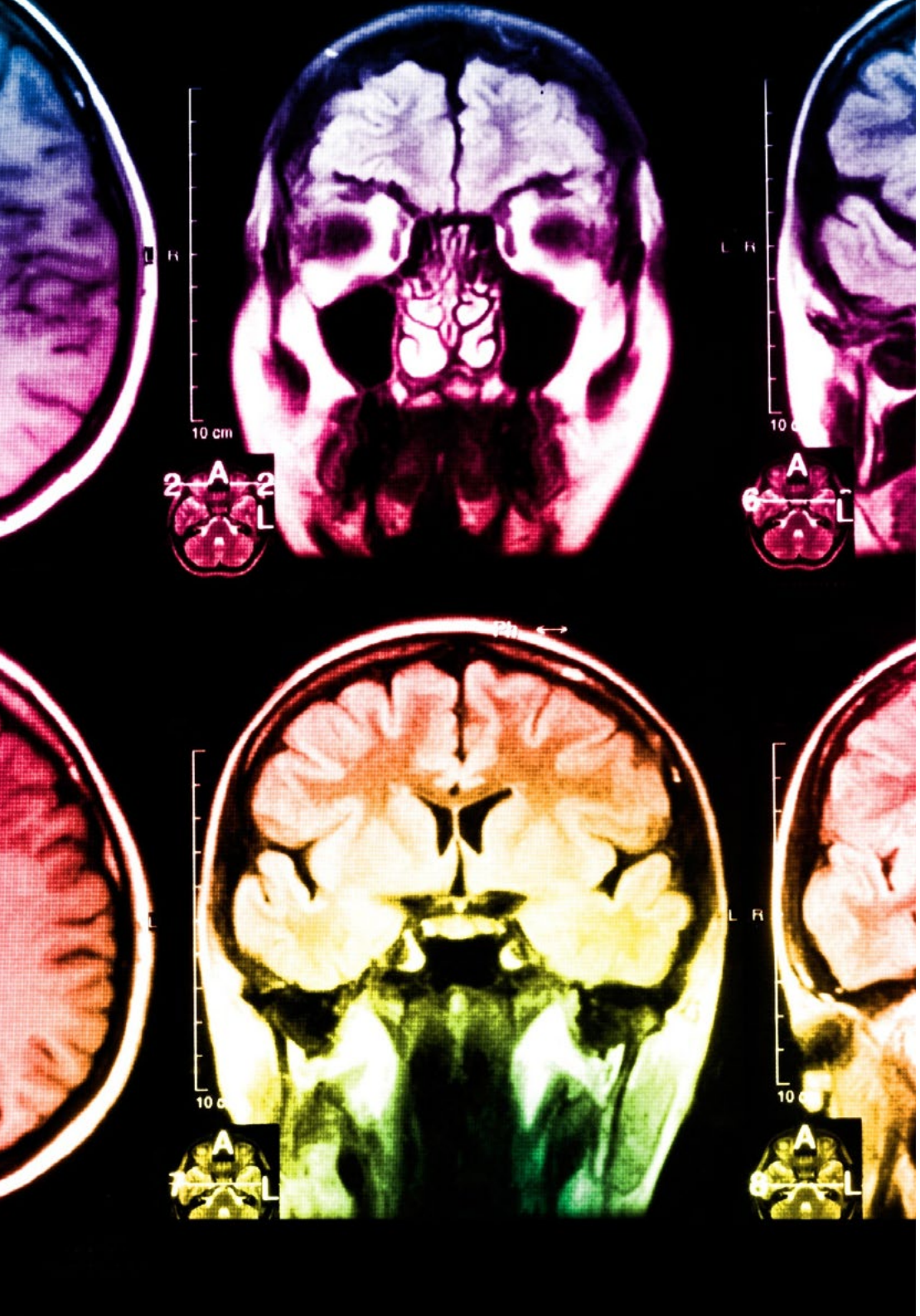
1. Nurses who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on practical skills that allow the nursing professional to better integrate knowledge acquisition into the hospital setting or primary care.
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 case studies with a 100% online learning system based on repetition combining a minimum of 8 different elements in each lesson, which is a real revolution compared to the simple study and analysis of cases.

The nurse will learn through real cases and by solving 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 we have trained more than 175,000 nurses with unprecedented success in all specialities regardless of practical workload. 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 really 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.

Nursing Techniques and Procedures on Video

We introduce you to the latest techniques, to the latest educational advances, 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 them as many times as you want.

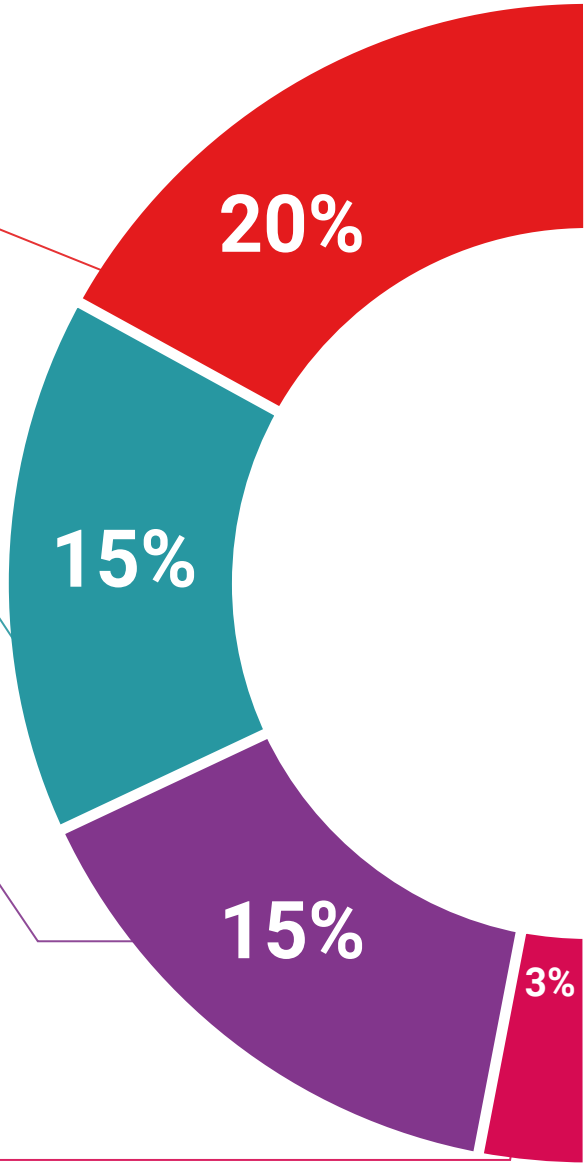
Interactive Summaries

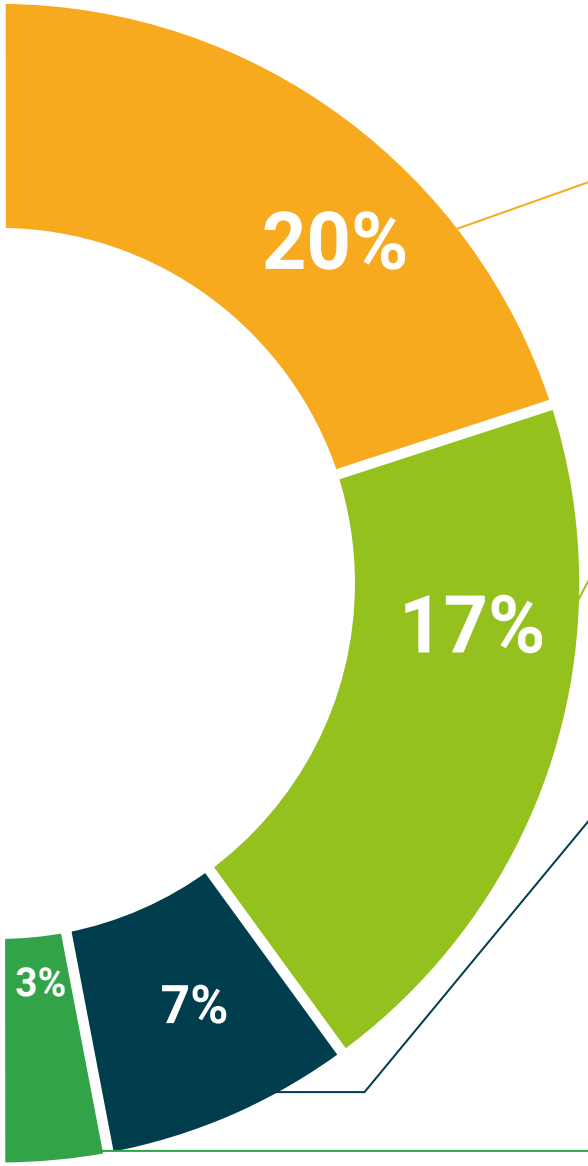
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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 suggesting that observing third-party experts can be useful.

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 Radiophysics in Diagnostic Imaging 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 Radiophysics in Diagnostic Imaging** contains the most complete and up-to-date scientific on the market.

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

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

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

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

Radiophysics in Diagnostic Imaging

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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