

# Postgraduate Certificate

## Radiation Protection in Hospital Radioactive Facilities



## Postgraduate Certificate Radiation Protection in Hospital Radioactive Facilities

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

Website: [www.techtute.com/us/nursing/postgraduate-certificate/radiation-protection-hospital-radioactive-facilities](http://www.techtute.com/us/nursing/postgraduate-certificate/radiation-protection-hospital-radioactive-facilities)

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# 01

# Introduction

Throughout history, Radiation Protection has evolved in response to the expanding use of ionizing radiation in cancer therapies. Ongoing scientific research into the harmful effects of radiation has driven the development of equipment to reduce the radiological trace in the body and redefined safety protocols. Faced with these innovative processes, nurses need to update their knowledge and skills on a regular basis. Therefore, TECH responds to this demand through a 100% online program that covers the most disruptive actions to certify the well-being of people in the face of high-energy radiation. Likewise, the innovative contents of this university program are accompanied by various multimedia resources such as explanatory videos, interactive summaries or self-knowledge tests.





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*You will delve into the dosimetric control of health professionals exposed to radiation and the control measures that you can implement as a nurse thanks to TECH”*

In a society characterized by the pursuit of environmental sustainability, medical centers have the opportunity to demonstrate their social responsibility to the public. Radiation protection not only aims to protect patients and healthcare personnel, but also to ensure that radiation has as little impact as possible on the natural environment. In this context, the nurses' tasks include the verification of environmental radiation and surface contamination detectors.

Their primary objective is to ensure that there is no pollution of the soil, water or air. It also ensures effective compliance with safety regulations, thus protecting the community.

Aware of the importance of protecting the population, TECH is developing a pioneering Postgraduate Certificate that will address the existing risks derived from the use of ionizing radiation in Hospital Radioactive Facilities. This will allow students to identify hazards and implement actions to promote a totally safe space. To this end, this syllabus will delve into the control of the airtightness of encapsulated radioactive sources, taking into account the limits and international certificates currently in force. Likewise, the syllabus will provide guidelines for graduates to identify the best structural shielding based on the calculation of thicknesses and other important parameters.

In addition, the entire university program will be taught 100% online, since the content of this program and its control will be carried out through the most complete Virtual Campus. In this way, students will be able to connect whenever they want, from wherever they want and through any device with an Internet connection, either through a computer, Tablet or cell phone. In this way, they will have the opportunity to keep up to date in a guaranteed way and combined with their work activity in healthcare centers. At the same time, they will be supported for the assimilation of new skills in the innovative Relearning methodology of which TECH is a pioneer.

This **Postgraduate Certificate in Radiation Protection in Hospital Radioactive Facilities** 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 obtain state-of-the-art knowledge that will allow you to recognize as a nurse the most frequent radiological risks in the hospital area"*

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*You will delve into the dosimetric control of patients to contribute to correctly set dose limits during treatments”*

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.

*Do you want to delve deeper into the verification of environmental radiation detectors? Achieve it in only 180 hours thanks to this exclusive qualification.*

*The Relearning system applied by TECH in its programs reduces the long hours of study so frequent in other teaching methods.*





# 02 Objectives

This Postgraduate Certificate will enable students to identify the radiological risks present in hospital centers. Graduates will design and implement safety plans to ensure the well-being of both patients and physicians. At the same time, they will strictly comply with international standards stipulating radiological protection. In this line, they will master the main specific parameters for the calculation of structural shielding in the services involved in radiation management: Nuclear Medicine, Radiation Oncology and Radiodiagnostics.







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*You will address the control of the hermeticity of encapsulated radioactive sources to avoid contamination by irradiation through this exclusive Postgraduate Certificate"*



## General Objectives

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- ♦ 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

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- Determine the radiological risks present in hospital radioactive facilities, as well as the specific magnitudes and units applied in these cases
- Establish the concepts applicable to the design of a radioactive facility, knowing the main specific parameters

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*Start this academic pathway now and you will maximize your professional horizons”*



# 03

## Course Management

The program includes in its teaching staff reference specialists in Radiation Protection in Hospital Radioactive Facilities, who pour into the program the experience of their work experience to this program. These professionals have participated in the design of the syllabus, as well as in the elaboration of the different syllabuses that make up the academic itinerary. In this way, after completing the program, the nurse will be able to work in various types of health institutions with extensive knowledge in radiological safety.



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*Learn with the best!" The diversity of talents and knowledge of the faculty will create a dynamic and enriching learning environment"*

## 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

- ♦ 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

After a historical contextualization of radiation protection, this program will focus on the analysis of the fundamental international legal concepts for the management of ionizing radiation. The agenda will delve into the distinctive aspects that nurses may encounter during irradiation management in 3 essential fields: Nuclear Medicine, Radiation Oncology and Radiodiagnostics. In addition, it will delve into the most effective measures to ensure safety in hospital facilities. On the other hand, the program will develop the main actions that are carried out in the centers such as the verification of radiation detectors or the realization of structural shielding.



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*A university program where you will acquire skills through the analysis of practical cases and the simulation of complex healthcare situations”*

## Module 1. Radiation Protection in Hospital Radioactive Facilities

- 1.1. Radiation Protection in Hospitals
  - 1.1.1. Radiation Protection in Hospitals
  - 1.1.2. Radiological Protection Magnitudes and Specialized Radiation Protection Units
  - 1.1.3. Risks in the Hospital Area
- 1.2. International Radiation Protection Standards
  - 1.2.1. International Legal Framework and Authorizations
  - 1.2.2. International Regulations on Health Protection against Ionizing Radiation
  - 1.2.3. International Regulations on Radiological Protection of the Patient
  - 1.2.4. International Regulations on the Specialty of Hospital Radiophysics
  - 1.2.5. Other International Regulations
- 1.3. Radiation Protection in Hospital Radioactive Facilities
  - 1.3.1. Nuclear Medicine
  - 1.3.2. Radiodiagnostics
  - 1.3.3. Radiotherapy oncology
- 1.4. Dosimetric Control of Exposed Professionals
  - 1.4.1. Dosimetric Control
  - 1.4.2. Dose Limits
  - 1.4.3. Personal Dosimetry Management
- 1.5. Calibration and Verification of Radiation Protection Instrumentation
  - 1.5.1. Calibration and Verification of Radiation Protection Instrumentation
  - 1.5.2. Verification of Environmental Radiation Detectors
  - 1.5.3. Verification of Surface Contamination Detectors
- 1.6. Tightness Control of Encapsulated Radioactive Sources
  - 1.6.1. Tightness Control of Encapsulated Radioactive Sources
  - 1.6.2. Methodology
  - 1.6.3. International Limits and Certificates
- 1.7. Design of Structural Shielding in Medical Radioactive Facilities
  - 1.7.1. Design of Structural Shielding in Medical Radioactive Facilities
  - 1.7.2. Important Parameters
  - 1.7.3. Thickness Calculation







- 1.8. Structural Shielding Design in Nuclear Medicine
  - 1.8.1. Structural Shielding Design in Nuclear Medicine
  - 1.8.2. Nuclear Medicine Facilities
  - 1.8.3. Calculation of the Workload
- 1.9. Structural Shielding Design in Radiotherapy
  - 1.9.1. Structural Shielding Design in Radiotherapy
  - 1.9.2. Radiotherapy Facilities
  - 1.9.3. Calculation of the Workload
- 1.10. Structural Shielding Design in Radiodiagnostics
  - 1.10.1. Structural Shielding Design in Radiodiagnostics
  - 1.10.2. Radiodiagnostics Facilities
  - 1.10.3. Calculation of the Workload

“*Interactive summaries of each topic will allow you to dynamically consolidate the concepts of dosimetric control. Don't miss the opportunity and enroll now*”

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"*

## 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.

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*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 Radiation Protection in Hospital Radioactive Facilities guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate 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 Radiation Protection in Hospital Radioactive Facilities** 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 Radiation Protection in Hospital Radioactive Facilities**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



\*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.

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

**tech** global  
university

**Postgraduate Certificate**  
Radiation Protection in Hospital  
Radioactive Facilities

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