Postgraduate Certificate

Radiophysics in External Radiotherapy in Physical Dosimetry

tech technological university

tech technological university

Postgraduate Certificate

Radiophysics in External Radiotherapy in Physical Dosimetry

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

Website: **www.techtitute.com/in/nursing/postgraduate-certificate/radiophysics-external-radiotherapy-physical-dosimetry**

Index

01

Introduction

Given the increasing prevalence of cancer cases worldwide, the priority for hospitals is to apply the most innovative therapies to tackle this problem. In this context, the Linear Electron Accelerator (LEA) has become a valuable tool for delivering precise doses to the surface of the skin. Aware of the advantages that this mechanism implies, the most prestigious health institutions are demanding the incorporation of personnel for their different services who can collaborate in the therapeutic integration of this equipment. Nurses looking to update their skills in this field can access a 100% online course designed by TECH that addresses the keys to managing this technology in order to get the most out of it.

Implement the most effective risk analysis systems to your work practice with this exclusive TECH program"

In the field of nursing, process maps are a powerful way to improve the quality of patient care. This tool describes aspects such as workflow, procedures and all user-related activities. In this way, healthcare professionals can identify inefficiencies and bottlenecks by visualizing the steps followed during treatments. Moreover, they will be able to carry out a standardization of procedures for all team members to reduce errors and improve patient safety.

With this in mind, TECH will develop an advanced program that covers the main safety controls in External Radiotherapy. Therefore, the curriculum will focus on the implementation of risk analysis and error reporting systems. In this way, Nursing professionals will be able to develop quality assurance programs in Physical Dosimetry. The agenda will also emphasize photon beam calibration protocols, taking into account the intrinsic precision of this type of treatment. In this line, the program will offer guidelines for the use of image-guided radiotherapy equipment, highlighting the Cone Beam Computed Tomography technique.

In order to consolidate these contents, the methodology of this program reinforces its innovative character. TECH offers a 100% online learning environment, adapted to the needs of busy professionals seeking to advance their careers. In addition, it will employ the *Relearning* methodology, based on the repetition of key concepts to fix knowledge and facilitate learning. In this way, the combination of flexibility and a robust pedagogical approach makes it highly accessible.

This **Postgraduate Certificate in Radiophysics in External Radiotherapy in Physical Dosimetry** contains the most complete and up-to-date scientific program on the market. Its most notable features are:

- 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 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

You will delve into the mechanisms and stages of photon beam calibration to ensure the accuracy of treatments thanks to this Postgraduate Certificate"

Do you want to broaden your practice as a nurse and work in specialized services in Computed Tomography? Achieve it through 150 hours of the best digital teaching"

You will apply the main guarantee, control and safety programs to make your nursing profile stand out in Physical Dosimetry services.

TECH's innovative Relearning system will allow you to consolidate knowledge with less effort and more performance, without the need to memorize.

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 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 Postgraduate Certificate will be designed for students to control the most sophisticated machinery during External Radiation Therapy treatments. In this way, graduates will carry out optimal therapy planning through the use of simulation equipment. Along the same lines, they will use photon and electron beams to determine the appropriate doses for each patient according to their respective needs. In addition, they will apply control programs that will provide the highest quality to their professional activities.

Increase your safety in decision making as nursing service personnel, updating your knowledge through this study program"

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

- Examine the quality control program of radiotherapy equipment

TECH's goal is to offer nurses the most complete program on the market so that they are able to excel and become more efficient in their profession"

03

Course Management

In line with its commitment to offer educational maximum excellence, TECH has a prestigious teaching staff. These specialists have an extensive work background, having been part of renowned health centers. Thanks to this, they are defined by having a deep knowledge of External Radiotherapy and being aware of the advances that have occurred in this field during the last decades. In this way, students have the guarantees they need to update their knowledge in a profession that is constantly advancing and offers numerous job opportunities.

A specialized teaching team will pour their extensive knowledge in the field of External Radiotherapy in Physical Dosimetry in this Postgraduate Certificate"

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. Morera Cano, Daniel

- Specialist in Hospital Radiophysics
- Hospital Radiophysics Faculty at the University Hospital Son Espases
- Master's Degree in Industrial Safety and Environment by the Polytechnic University of Valencia
- Master's Degree in Radiological Protection in Radioactive and Nuclear Facilities
- Degree in Industrial Engineering from the Polytechnic University of Valencia

04

Structure and Content

This syllabus, consisting of 150 hours of learning, will analyze the equipment used in External Radiation Therapy for the treatment of patients. In this way, the syllabus will delve into the most avant-garde technological tools to perform simulations and image-guided treatments (among which the electron linear accelerator stands out). The program will also emphasize the need for therapies to correspond to those previously calculated in the planning system. The learning materials will also delve into the quality controls necessary to ensure safety during interventions.

You will delve into the Initial Reference State to effectively assess response to therapies after completing this academic pathway"

Module 1. External Radiotherapy. Physical Dosimetry

1.1. Linear Electron Accelerator. Equipment in External Radiotherapy
- 1.1.1. Linear Electron Accelerator (LEA)
- 1.1.2. External Radiotherapy Treatment Planner (TPS)
- 1.1.3. Record Keeping and Verification System
- 1.1.4. Special Techniques
- 1.1.5. Hadrontherapy

1.2. Simulation and Localization Equipment in External Radiation Therapy
- 1.2.1. Conventional Simulator
- 1.2.2. Computed Tomography (CT) Simulation
- 1.2.3. Other Image Modalities

1.3. Image-guided External Radiation Therapy Equipment
- 1.3.1. Simulation equipment
- 1.3.2. Image-guided Radiotherapy Equipment. CBCT
- 1.3.3. Image-guided Radiotherapy Equipment. Planar Image
- 1.3.4. Auxiliary Localization Systems

1.4. Photon Beams in Physical Dosimetry
- 1.4.1. Measuring Equipment
- 1.4.2. Calibration Protocols
- 1.4.3. Calibration of Photon Beams
- 1.4.4. Relative Dosimetry of Photon Beams

1.5. Electron Beams in Physical Dosimetry
- 1.5.1. Measuring Equipment
- 1.5.2. Calibration Protocols
- 1.5.3. Calibration of Electron Beams
- 1.5.4. Relative Dosimetry of Electron Beams

1.6. Implementation of External Radiotherapy Equipment
- 1.6.1. Installation of External Radiotherapy Equipment
- 1.6.2. Acceptance of External Radiotherapy Equipment
- 1.6.3. Initial Reference Status (IRS)
- 1.6.4. Clinical Use of External Radiotherapy Equipment
- 1.6.5. Treatment Planning Systems

1.7. Quality Control of External Radiotherapy Equipment
- 1.7.1. Quality Control of Linear Accelerators
- 1.7.2. Quality Control in the IGRT Equipment
- 1.7.3. Quality Control in Simulation Systems
- 1.7.4. Special Techniques

1.8. Quality Control of Radiation Measuring Equipment
- 1.8.1. Dosimetry
- 1.8.2. Measuring Tools
- 1.8.3. Mannequins Employed

1.9. Application of Risk Analysis Systems in External Radiation Therapy
- 1.9.1. Risk Analysis Systems
- 1.9.2. Error Reporting Systems
- 1.9.3. Process Mapping

1.10. Quality Assurance Programming in Physical Dosimetry
- 1.10.1. Responsibilities
- 1.10.2. Requirements in External Radiotherapy
- 1.10.3. Quality Assurance Programming Clinical and Physical Aspects
- 1.10.4. Maintenance of Quality Control Program

Access the multimedia resources library and the entire syllabus from day one. Forget about both fixed schedules and face-to-face attendance!"

05

Methodology

This 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:

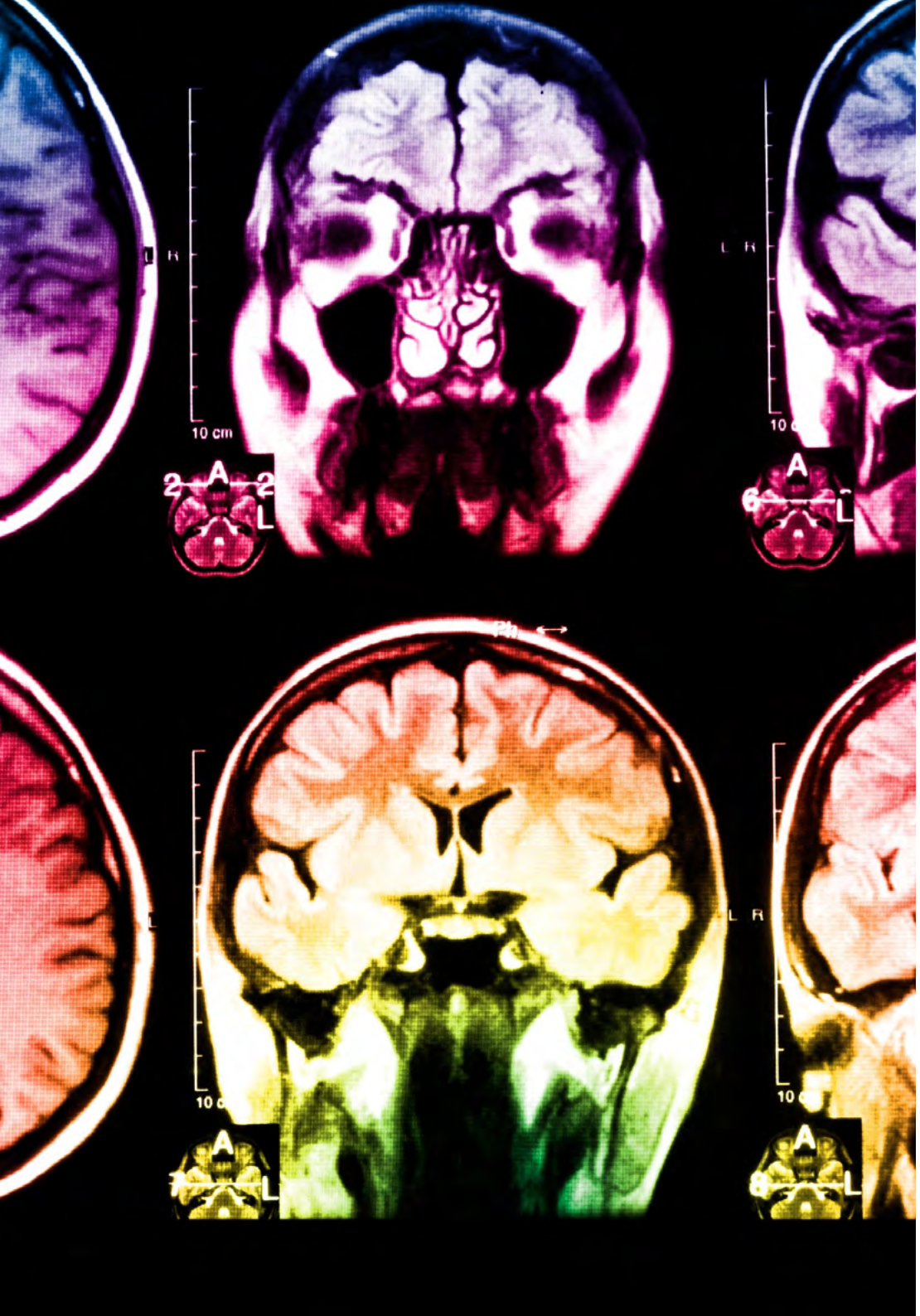
1. Nurses who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on practical skills that allow the nursing professional to better integrate knowledge acquisition into 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

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.

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 prepared more than 175,000 nurses with unprecedented success in all specialities regardless of practical workload. Our educational 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 adapted in 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.

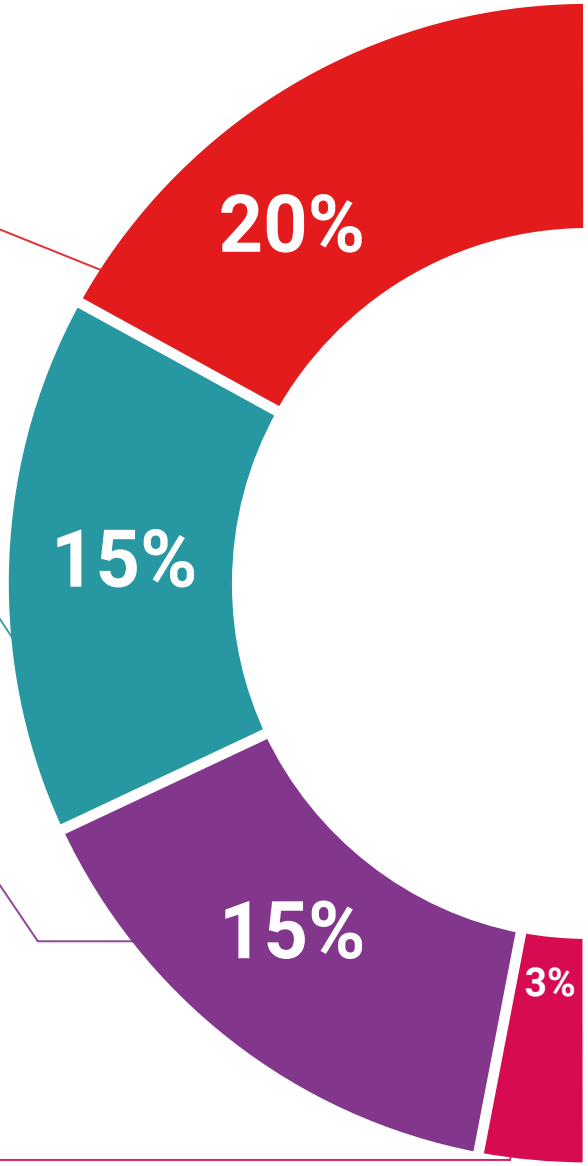
Interactive Summaries

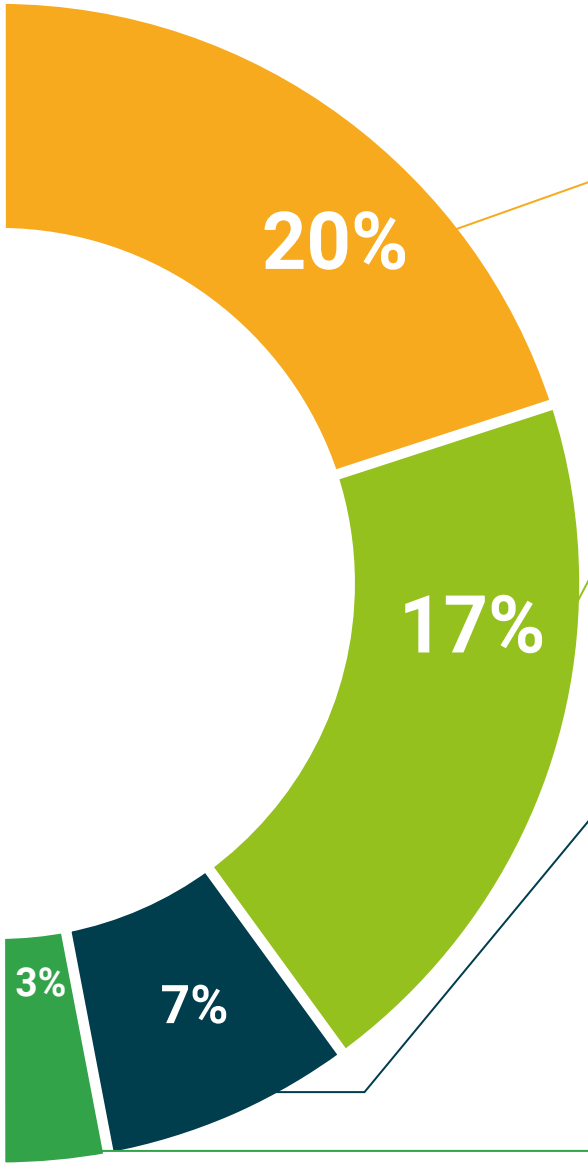
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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

The student's knowledge is periodically assessed and re-assessed throughout the program, through evaluative and self-evaluative activities and exercises: in this way, students can check how they are doing in terms of 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 External Radiotherapy in Physical Dosimetry 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"

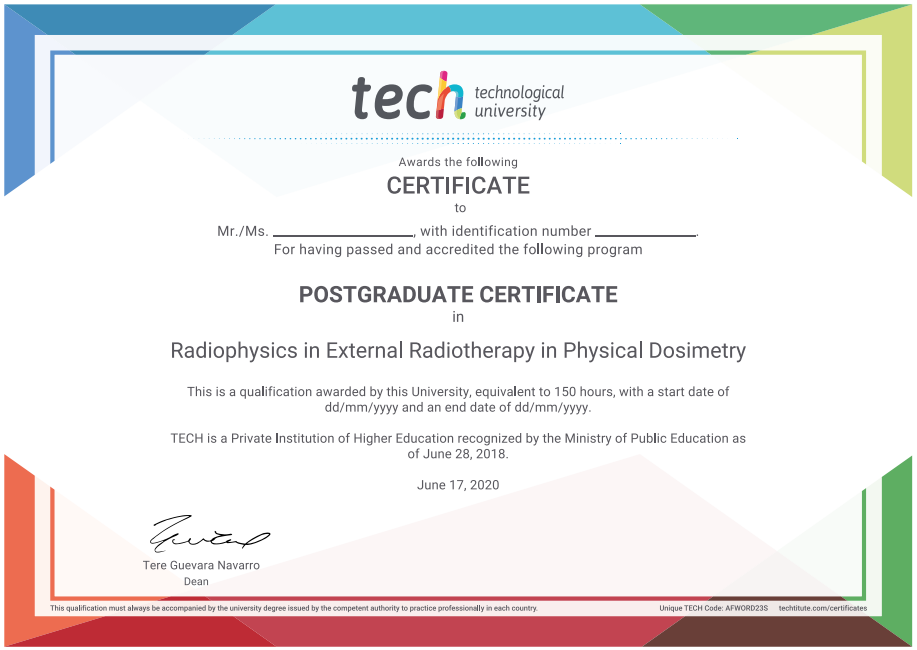
This **Postgraduate Certificate in Radiophysics in External Radiotherapy in Physical Dosimetry** contains the most complete and up-to-date scientific program on the market.

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 Radiophysics in External Radiotherapy in Physical Dosimetry**

Official Nº of Hours: **150 h.**


tech technological university

Awards the following

CERTIFICATE

to

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

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Radiophysics in External Radiotherapy in Physical Dosimetry

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.

tech technological university

Postgraduate Certificate

Radiophysics in External Radiotherapy in Physical Dosimetry

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

Postgraduate Certificate

Radiophysics in External Radiotherapy in Physical Dosimetry

tech technological university