

Postgraduate Certificate Radiophysics in Brachytherapy





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- » 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/radiophysics-brachytherapy

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01

Introduction

Cervical cancer is a common condition in women, with an estimated incidence of 604,000 cases per year according to the World Health Organization. This disease can be cured if diagnosed at an early stage and addressed promptly. That is why health experts are working to accelerate its elimination through the most innovative treatments. In this context, nurses play a key role as they are in charge of various processes, such as patient monitoring and supervising patient safety during the administration of treatments with state-of-the-art Brachytherapy equipment, for example. To expand the skills of these professionals, TECH has designed a comprehensive program in 100% online mode that relies on the disruptive *Relearning* methodology.





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Want to broaden your perspectives and knowledge as a Nuclear Medicine Nurse Practitioner? Get it with TECH through this innovative program”

After completion of Brachytherapy-related therapies, review of clinical outcomes must occur in a comprehensive manner. The nursing staff is critical during this process to develop comprehensive patient monitoring. For this reason, these professionals must have up-to-date knowledge and skills that allow them to assess patients according to the most up-to-date scientific criteria and to inform physicians as quickly as possible. However, achieving this comprehensive knowledge is a complex task because most of the curricula are still taught in a face-to-face mode. This makes it difficult to develop and combine with other work responsibilities.

In response to this, TECH offers nurses a complete program in 100% online mode. Through its exhaustive syllabus, it will cover the most innovative procedures that involve the praxis of these health professionals in Hospital Radiophysics Services. In addition, the university program will cover the most innovative technologies related to Brachytherapy, its functions and characteristics. Likewise, the syllabus will delve into the management of radiological safety during these treatments, taking into account the most updated protocols of action.

On the other hand, this unique program will have an innovative 100% online mode and a didactic platform equipped with cutting-edge learning resources. These will include various multimedia materials such as explanatory videos, interactive summaries and self-knowledge tests. TECH will also provide students with a complete study system: *Relearning*. This will provide the assimilation of complex concepts through gradual and intensive reiteration throughout the syllabus. In this way, graduates will avoid having to memorize the contents and will be able to incorporate them into their work practice in a more flexible and efficient way.

This **Postgraduate Certificate in Radiophysics in Brachytherapy** contains the most complete and up-to-date scientific program on the market. Its most outstanding 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 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



Analyze the main radiation sources used and be able to calibrate them to ensure dose accuracy"

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You will carry out equipment quality control and ensure patient safety at all times following the study of this program”

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's design focuses on Problem-Based Learning, through which the professional must try to solve the different professional practice situations that arise during the academic program. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.

You will delve into the use of the most sophisticated interventional devices and catheters so that your nursing practice stands out for its innovative approach.

You will have access to a learning system based on repetition with natural and progressive teaching throughout the entire syllabus: Relearning.



02 Objectives

Thanks to this 150-hour program, the students will become experts in the Brachytherapy technique, thus contributing significantly to clinical practice and research in Hospital Radiophysics. In this sense, they will apply to their procedures the source calibration techniques by means of well and air chambers. Likewise, they will effectively evaluate dose planning systems through the advanced TG 43 formalism. Similarly, students will use the Monte Carlo Method to improve both medical care and to assess risks associated with therapies.





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The skills you will acquire after completion of this Postgraduate Certificate will enable you to collaborate with medical staff in a holistic way during Brachytherapy sessions”



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 application of the Monte Carlo Method in Brachytherapy
- ♦ Evaluate planning systems using the TG 43 formalism
- ♦ Dose planning in Brachytherapy
- ♦ Identify and analyze the key differences between High Dose Rate (HDR) and Low Dose Rate Brachytherapy (LDR)

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Enroll now in a flexible university program, without fixed schedules and with content available 24 hours a day. Enroll now!”

03

Course Management

In its commitment to offer a first class education, TECH has selected reputable professionals for the nurse to acquire solid knowledge in Brachytherapy. Therefore, this program has a highly qualified faculty with extensive professional experience in this sector. In this way, they will offer, from their experience, the best tools for the graduate to develop their skills in the initial evaluation of the newborn and to be able to apply them to their daily practice. Therefore, the student has the guarantees that they require to specialize at an international level in a booming sector that will catapult them to professional success.



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An experienced teaching staff will guide you throughout the learning process and will resolve any doubts that may arise"

Management



Dr. De Luis Pérez, Francisco Javier

- ♦ 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

Ms. Milanés Gaillet, Ana Isabel

- ♦ Radiophysicist at the University Hospital 12 de Octubre
- ♦ Medical Physicist at the Beata María Ana Hospital of Hermanas Hospitalarias
- ♦ Expert in Radiological Anatomy and Physiology from the Spanish Society of Medical Physics
- ♦ Expert in Medical Physics from the International University of Andalusia
- ♦ Degree in Physics from the Autonomous University of Madrid



04

Structure and Content

This university program establishes a solid foundation on the physical and biological fundamentals that support Brachytherapy. Accordingly, the curriculum will focus on vital aspects of this therapeutic treatment modality, including radiation dose and distribution. Likewise, the syllabus offers specific clinical indications in the approach to different types of cancer (including prostate, cervical and breast cancer). The didactic materials will also foster the development of research skills, while promoting interdisciplinary collaboration to carry out scientific inquiries and to handle state-of-the-art technological tools in the field.





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This program gives you the opportunity to update your knowledge in a real scenario, with the maximum scientific rigor of a leading academic institution"

Module 1. Brachytherapy in the Field of Radiotherapy

- 1.1. Brachytherapy
 - 1.1.1. Physical Principles of Brachytherapy
 - 1.1.2. Biological Principles and Radiobiology Applied to Brachytherapy
 - 1.1.3. Brachytherapy and External Radiotherapy. Differences
- 1.2. Radiation Sources in Brachytherapy
 - 1.2.1. Radiation Sources Used in Brachytherapy
 - 1.2.2. Radiation Emission of the Sources Used
 - 1.2.3. Calibration of Sources
 - 1.2.4. Safety in the Handling and Storage of Brachytherapy Sources
- 1.3. Dose Planning in Brachytherapy
 - 1.3.1. Techniques of Dose Planning in Brachytherapy
 - 1.3.2. Optimization of the Dose Distribution in the Target Tissue
 - 1.3.3. Application of the Monte Carlo Method
 - 1.3.4. Specific Considerations to Minimize Irradiation of Healthy Tissues
 - 1.3.5. TG 43 Formalism
- 1.4. Administration Techniques in Brachytherapy
 - 1.4.1. High Dose Rate Brachytherapy (HDR) versus Low Dose Rate Brachytherapy (LDR)
 - 1.4.2. Clinical Procedures and Treatment Logistics
 - 1.4.3. Management of Devices and Catheters Used in the Administration of Brachytherapy
- 1.5. Clinical Indications for Brachytherapy
 - 1.5.1. Application of Brachytherapy in the Treatment of Prostate cancer.
 - 1.5.2. Brachytherapy in Cervical Cancer: Technique and Results
 - 1.5.3. Brachytherapy in Breast Cancer: Clinical Considerations and Results.
- 1.6. Brachytherapy Quality Management
 - 1.6.1. Specific Quality Management Protocols for Brachytherapy
 - 1.6.2. Quality Control of Equipment and Treatment Systems
 - 1.6.3. Audit and Compliance with Regulatory Standards





- 1.7. Clinical Results in Brachytherapy
 - 1.7.1. Review of Clinical Studies and Outcomes in the Treatment of Specific Cancers
 - 1.7.2. Brachytherapy Efficacy and Toxicity Assessment
 - 1.7.3. Clinical Cases and Discussion of Results
- 1.8. Ethics and International Regulatory Aspects in Brachytherapy
 - 1.8.1. Ethical Issues in Shared Decision-Making with Patients
 - 1.8.2. Compliance with International Radiation Safety Standards and Regulations
 - 1.8.3. International Liability and Legal Aspects in Brachytherapy Practice
- 1.9. Technological Development in Brachytherapy
 - 1.9.1. Technological Innovations in the Field of Brachytherapy
 - 1.9.2. Research and Development of New Techniques and Devices in Brachytherapy
 - 1.9.3. Interdisciplinary Collaboration in Brachytherapy Research Projects
- 1.10. Practical Application and Simulations in Brachytherapy
 - 1.10.1. Clinical Simulation for Brachytherapy
 - 1.10.2. Resolution of Practical Situations and Technical Challenges
 - 1.10.3. Evaluation of Treatment Plans and Discussion of Results



This program includes real case studies and exercises to expand your Nursing skills in the Radiophysics setting. 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.

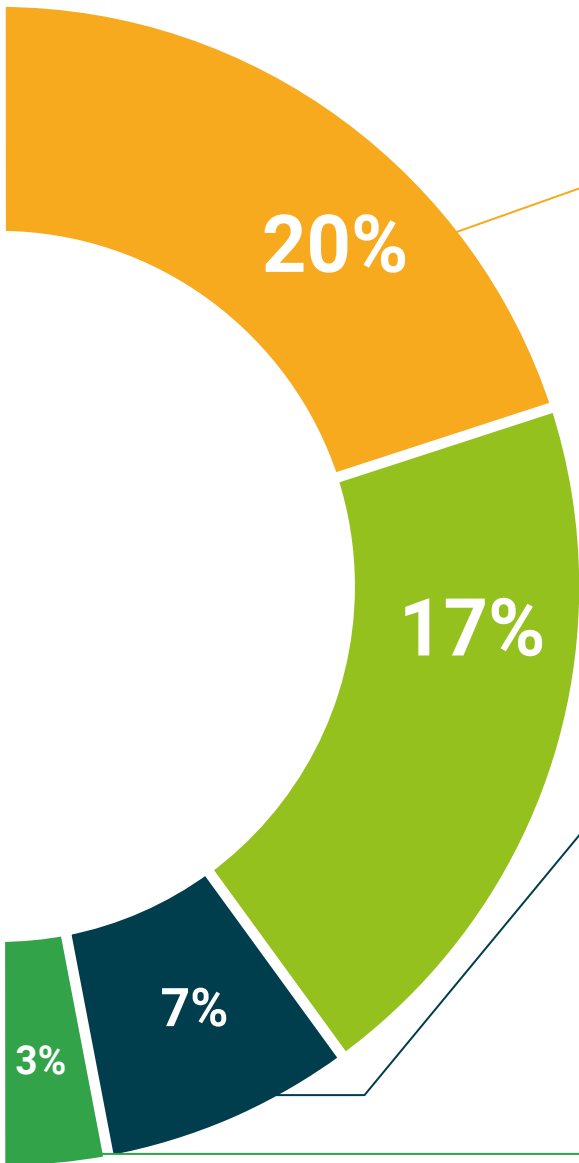
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



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 Radiophysics in Brachytherapy 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 Radiophysics in Brachytherapy** 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 Brachytherapy**

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.



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