Postgraduate Certificate

Radiophysics in Brachytherapy

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Postgraduate Certificate

Radiophysics in Brachytherapy

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

Website: www.techtitute.com/us/medicine/postgraduate-certificate/radiophysics-brachytherapy

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01

Introduction

Prostate cancer has become one of the leading causes of death for men worldwide, affecting one-third of men. Faced with this situation, health experts have developed new therapies to combat this pathology thanks to the advance of new technologies. Consequently, Brachytherapy is an effective tool for dealing with this type of adenocarcinoma. One of its benefits is that it provides a more focused treatment, which implies a lower probability of adverse reactions. In this regard, TECH has developed a pioneering qualification aimed at doctors who want to be up to date with this advanced radiotherapy technique. In addition, it is taught 100% online, without timetables or unnecessary travel, for greater convenience.

A 100% online university program that will incorporate into your work practice new techniques and the comprehensive management of devices with which you will innovate in the radiological sector"

In the context of brachytherapy, the TG-43 formalism is an indispensable element for calculating the radioactive sources used in clinical practice. Expressed in mathematical formulas incorporating dosimetric parameters, this mechanism provides the necessary calculations to delimit the dose distribution in the patient's tissue. In this way, it helps physicians design treatments that deliver precise therapeutic doses to the target area. In addition, it serves to ensure compliance with standards and regulations in the area of radiotherapy to maintain high quality standards in procedures.

In this context, TECH will provide physicians seeking to update their knowledge with a pioneering program. Through its program, specialists will delve into this procedure and the techniques that will ensure the use of the appropriate dose to treat different types of cancer and protect surrounding healthy tissues. Backed by an experienced teaching team, the expert will also delve into optimal management techniques. In addition, the program will offer clinical considerations and outcomes in conditions such as breast and cervical cancer. They will also address ethical issues in shared decision making with patients. In this way, graduates will make informed clinical decisions in different oncological scenarios.

It should be noted that students will only require a device with Internet access to access the didactic material. In this sense, the schedules and evaluation chronograms can be planned individually. It should be noted that the syllabus will be based on the innovative *Relearning* teaching system that relies on repetition to guarantee the mastery of its different aspects. At the same time, it mixes the learning process with real situations so that knowledge is acquired in a natural and progressive way, without the extra effort of memorizing. Also, the program uses resources in various formats such as explanatory videos, interactive summaries and infographics.

This **Postgraduate Certificate in Radiophysics in Brachytherapy** 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 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 apply the Monte Carlo method to perform the most reliable radiation dose calculations after studying this TECH program"

You will delve into the specific considerations to reduce irradiation of healthy tissues and reduce side effects after studying this Postgraduate Certificate"

You will handle the most effective devices and catheters in the administration of Brachytherapy through this updated curriculum.

Thanks to the Relearning system used by TECH you will reduce the long hours of study and memorization.

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'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.

02

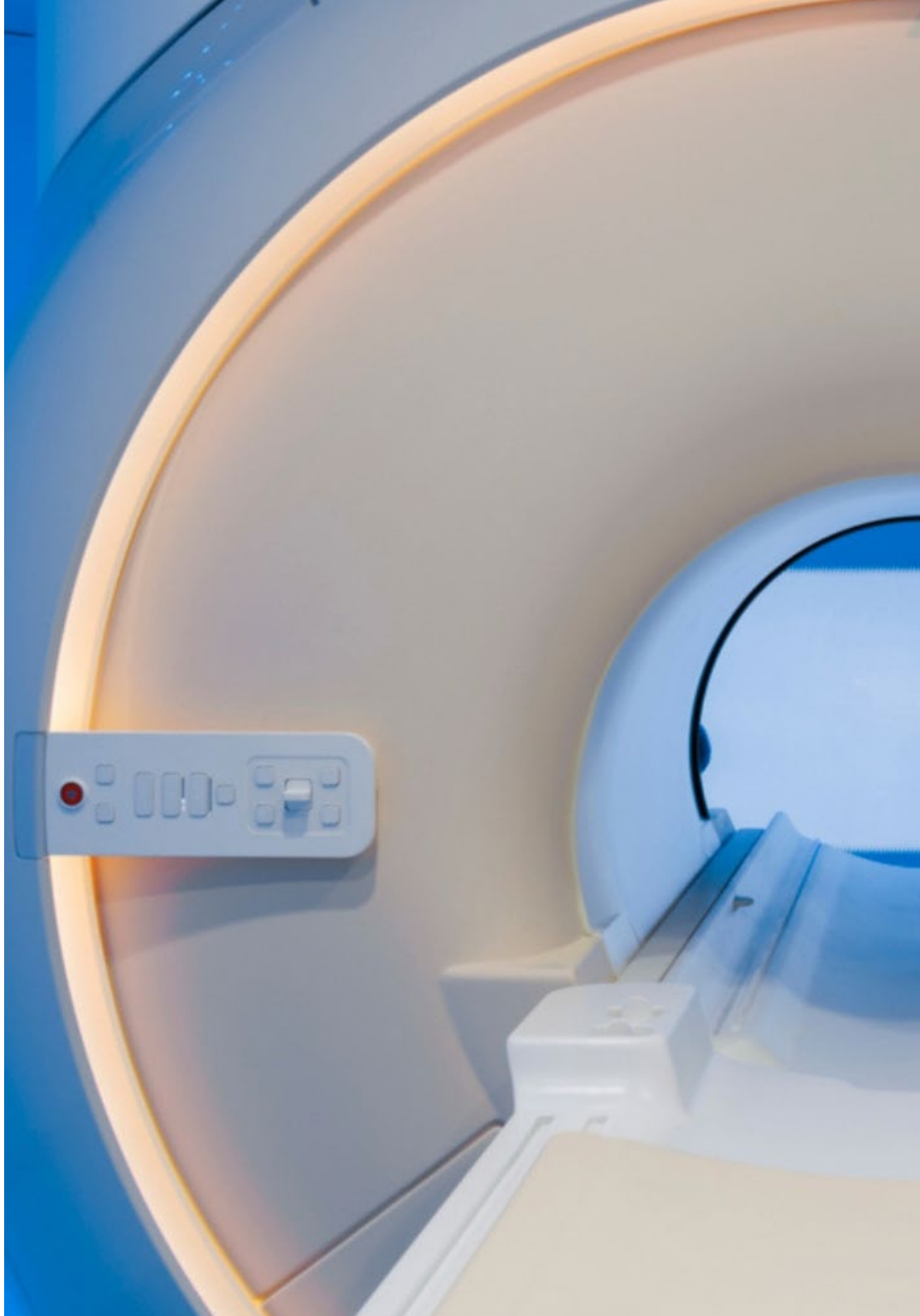
Objectives

This curriculum will constitute a unique academic experience that will allow the physician to locate and compare the various radiation sources used in Brachytherapy. Graduates will be highly qualified to develop strategies oriented to the distribution of radiation in the target tissue. Likewise, specialists who complete this academic pathway will evaluate planning systems using the TG 43 formalism and apply the Monte Carlo method to simulate how X-rays interact with body organs.

The basic premise of TECH is to enhance your skills and to help you achieve professional excellence in your daily medical practice"

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)

You will develop strategies to minimize irradiation of surrounding healthy tissues after studying this 100% online program"

03

Course Management

TECH is committed to providing educational excellence through the world-class faculty of this program of study. These professionals of Radiophysics in Brachytherapy who make up this teaching staff have a wide working background, being part of renowned institutions. For this reason, the syllabus that makes up this training has a deep knowledge of the subject and offers the best tools for students to develop their skills throughout the Postgraduate Certificate.

This TECH program has a distinguished teaching staff in charge of selecting the most advanced and disruptive topics related to Brachytherapy"

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

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

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Structure and Content

This study plan develops a solid foundation in the understanding of the fundamentals of Brachytherapy. In this line, the syllabus will delve into the radiation sources used in this type of radiotherapy, while at the same time developing the calibration processes. Likewise, the training will address in depth the clinical applications in the approach to conditions such as cervical cancer. The program will also offer resources related to dose planning, administration techniques and quality management. In this way, students will have the scientific basis for the approach to tumors with radiotherapy.

You will acquire a comprehensive update on well chamber source calibration techniques in only 6 weeks. Bet on TECH!"

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

From home and using the mobile device of your choice: this is the academic experience provided by TECH, the best digital university in the world according to Forbes"

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 we use the Case Method

What should a professional do in a given situation? 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. Specialists learn better, faster, and more sustainably over time.

With TECH you will experience a way of learning 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, trying to recreate the real conditions in the physician's professional 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:

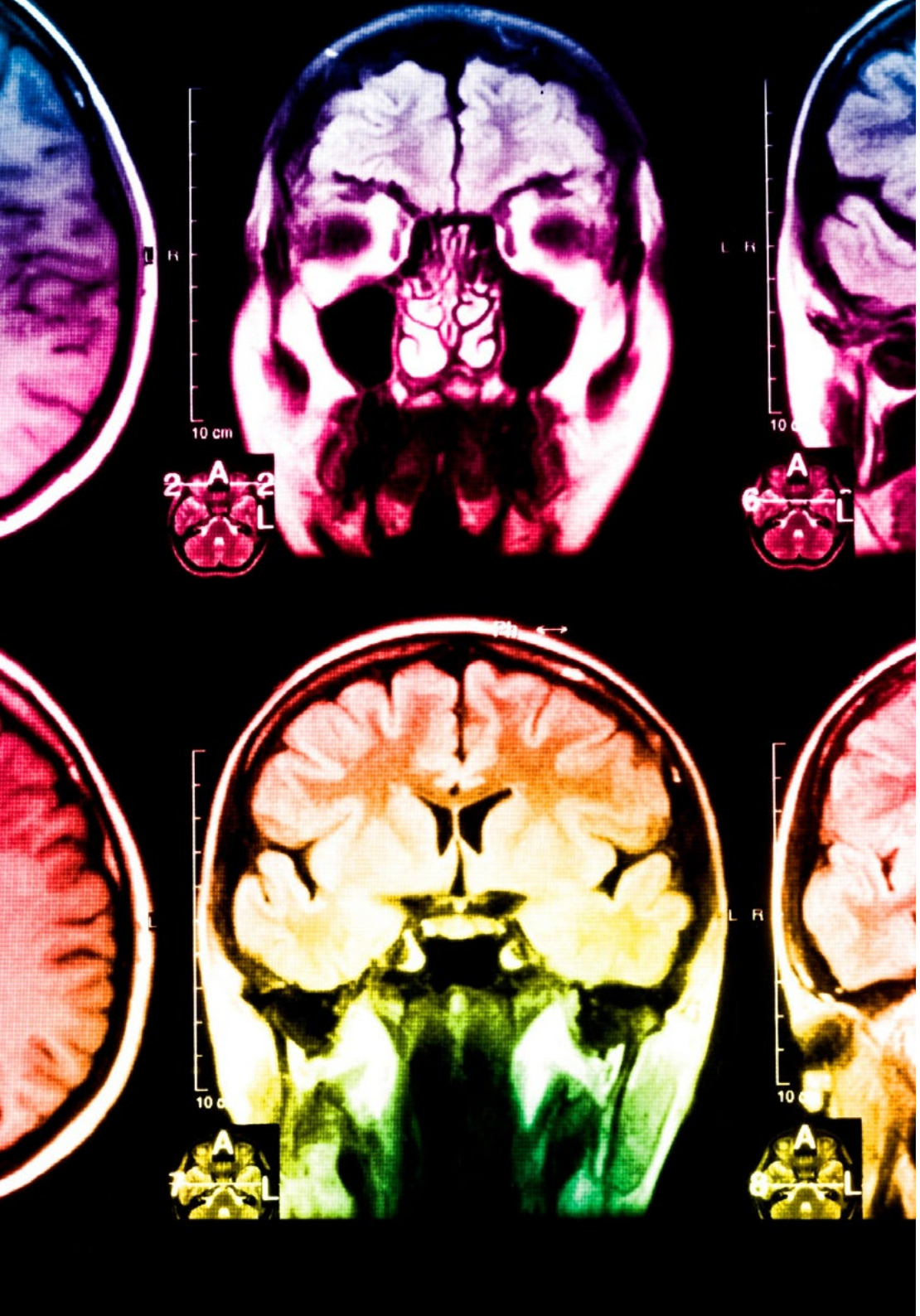
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
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 the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

Professionals will learn through real cases and by resolving 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, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. 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 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.

Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and 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 the videos as many times as you like.

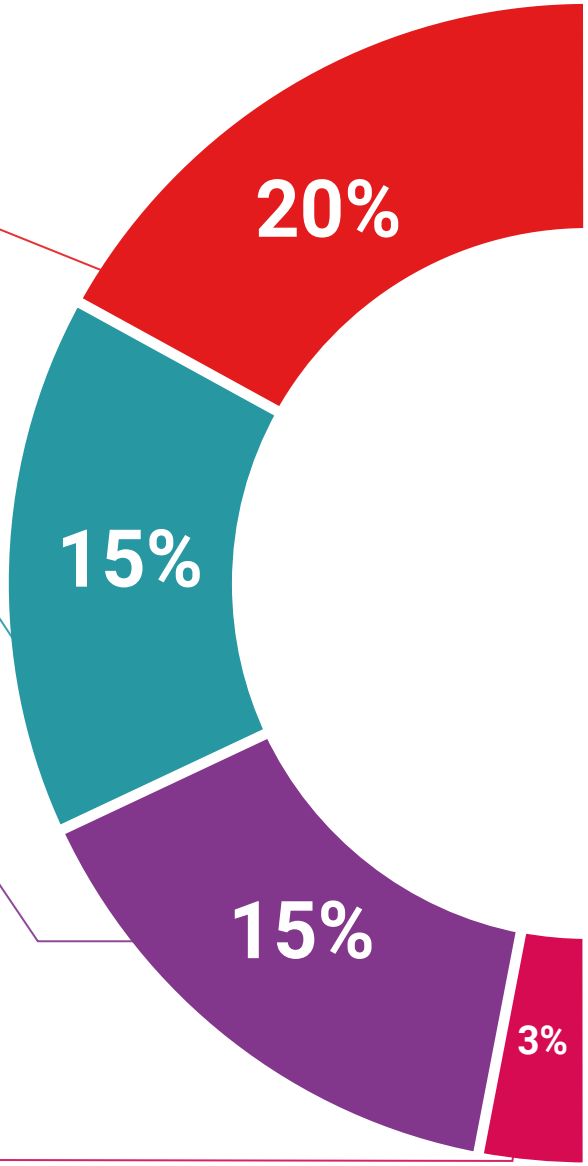
Interactive Summaries

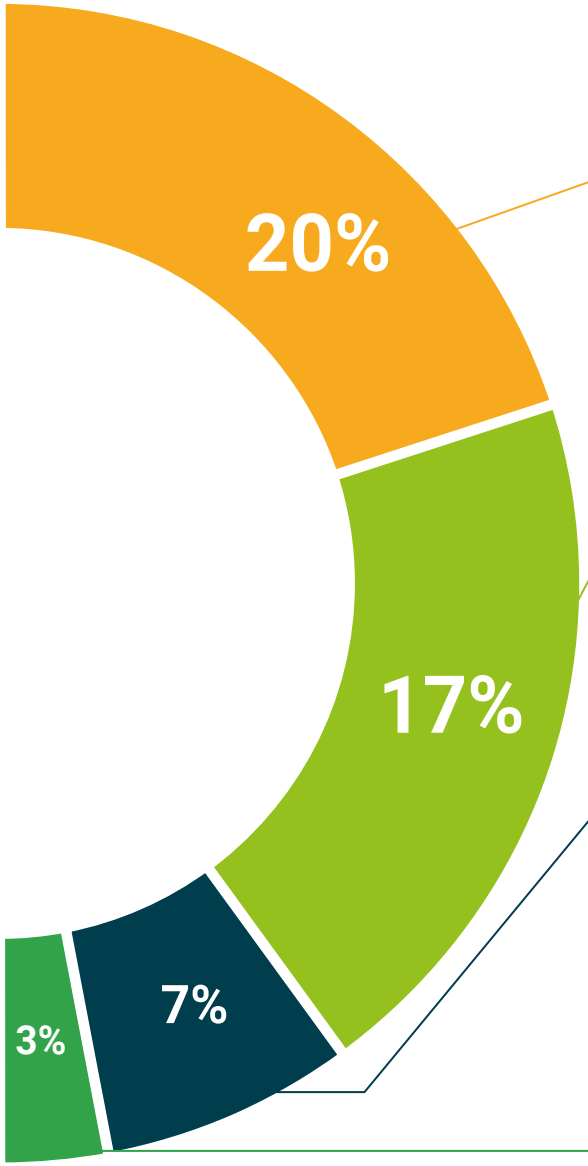
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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 on the usefulness of learning by observing experts. The system known as 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.

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.

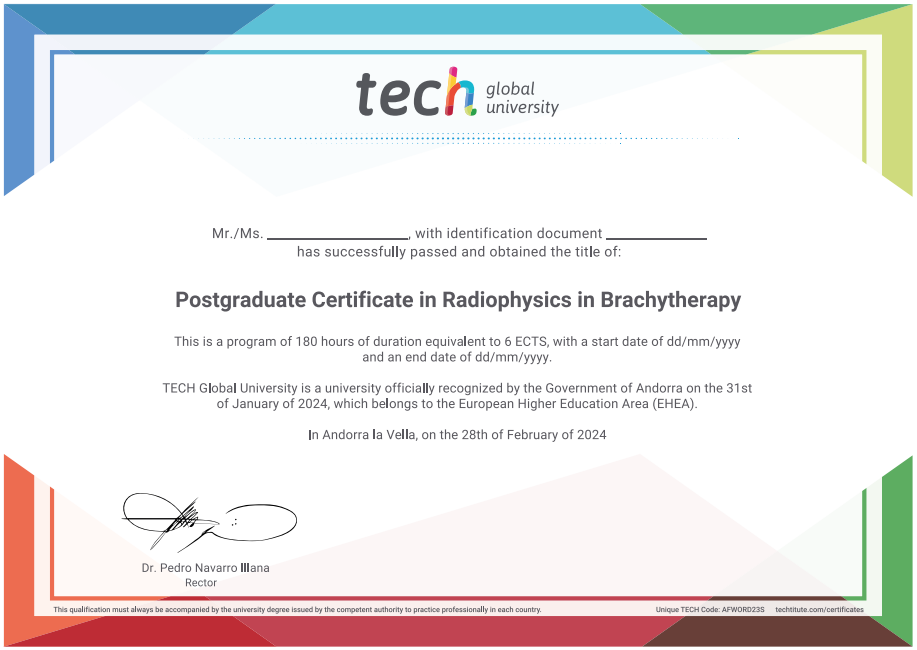
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Radiophysics in Brachytherapy**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**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Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Certificate in Radiophysics in Brachytherapy

This is a program of 180 hours of duration equivalent to 6 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

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 diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

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Postgraduate Certificate

Radiophysics in Brachytherapy

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