Postgraduate Certificate

Radiophysics in Brachytherapy

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Postgraduate Certificate
Radiophysics in Brachytherapy

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

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

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01

Introduction

Facing the current panorama of Medical Engineering, Brachytherapy emerges as a crucial field. In fact, the demand for engineers specialized in this field is more pressing than ever, since the research of new techniques is positioned as a cornerstone to improve oncological treatments. The complexity of these procedures and the need for more advanced devices require professionals with specialized skills. This program arises in response to the growing importance of research and development in this novel technique, giving engineers the opportunity to lead innovations and contribute to the continuous advancement of medical technology. Therefore, this syllabus, based on *Relearning*, is launched to reinforce key concepts and ensure in-depth understanding.

Thanks to this innovative TECH program, you will be at the forefront of innovation in Radiotherapy, specializing in the pioneering technique of Brachytherapy"

In the current landscape of medical engineering, brachytherapy has emerged as a fundamental discipline for cancer treatment. In a context where interdisciplinary collaboration is essential, engineers play a key role, as the complexity inherent in this innovative treatment requires close collaboration between these professionals and the healthcare team, stressing the critical need for specialized training.

This is how this university program was born, responding directly to this scenario by providing engineers with the skills and knowledge necessary to successfully integrate their technical competencies with the specific clinical demands of this technique. As for the syllabus, throughout the Postgraduate Certificate in Radiophysics in Brachytherapy, the application of the Monte Carlo Method, an indispensable tool for the precise simulation of dose distribution in tissues.

Furthermore, the evaluation of planning systems, using the TG 43 formalism, will become a vital component of the program, enabling graduates to understand and apply advanced methods in treatment planning. In addition, the differentiation between High Dose Rate Brachytherapy (HDR) and Low Dose Rate Brachytherapy (LDR) will be thoroughly investigated, providing a thorough understanding of the particularities and challenges associated with each approach.

In this way, the methodology of the academic itinerary, completely online and based on the *Relearning*method, will guarantee effective and flexible learning for professionals in constant activity. Likewise, the repetition of key concepts will reinforce the understanding and practical application of the acquired knowledge, allowing students to excel in the dynamic field of brachytherapy.

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

- The development of practical cases presented by experts in Radiophysics in Brachytherapy
- The graphic, schematic and practical contents with which it is conceived provide cutting- Therapeutics and practical information on those 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

Through 150 hours of the best digital teaching, you will develop skills in the management of specific equipment and devices for brachytherapy procedures"

You will delve into technological development and the latest trends in brachytherapy devices at the best digital university in the world, according to Forbes"

Thanks to this program, you will be able to collaborate effectively with medical professionals, for a safe and efficient implementation of brachytherapy.

This university program will allow you to meet your professional aspirations in just 6 weeks. Enroll now!.

The program includes, in its teaching staff, professionals from the sector who pour into 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

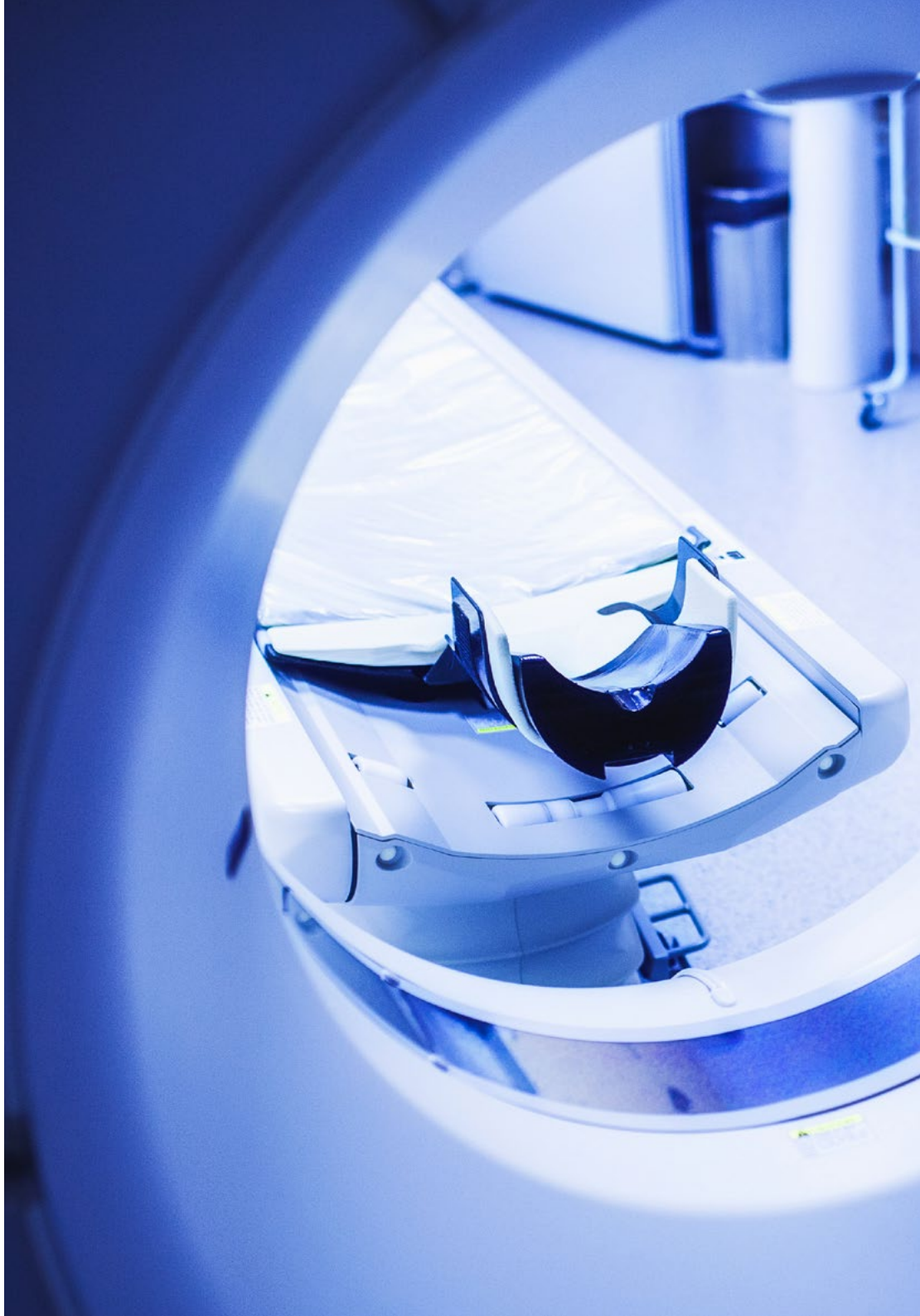
Objectives

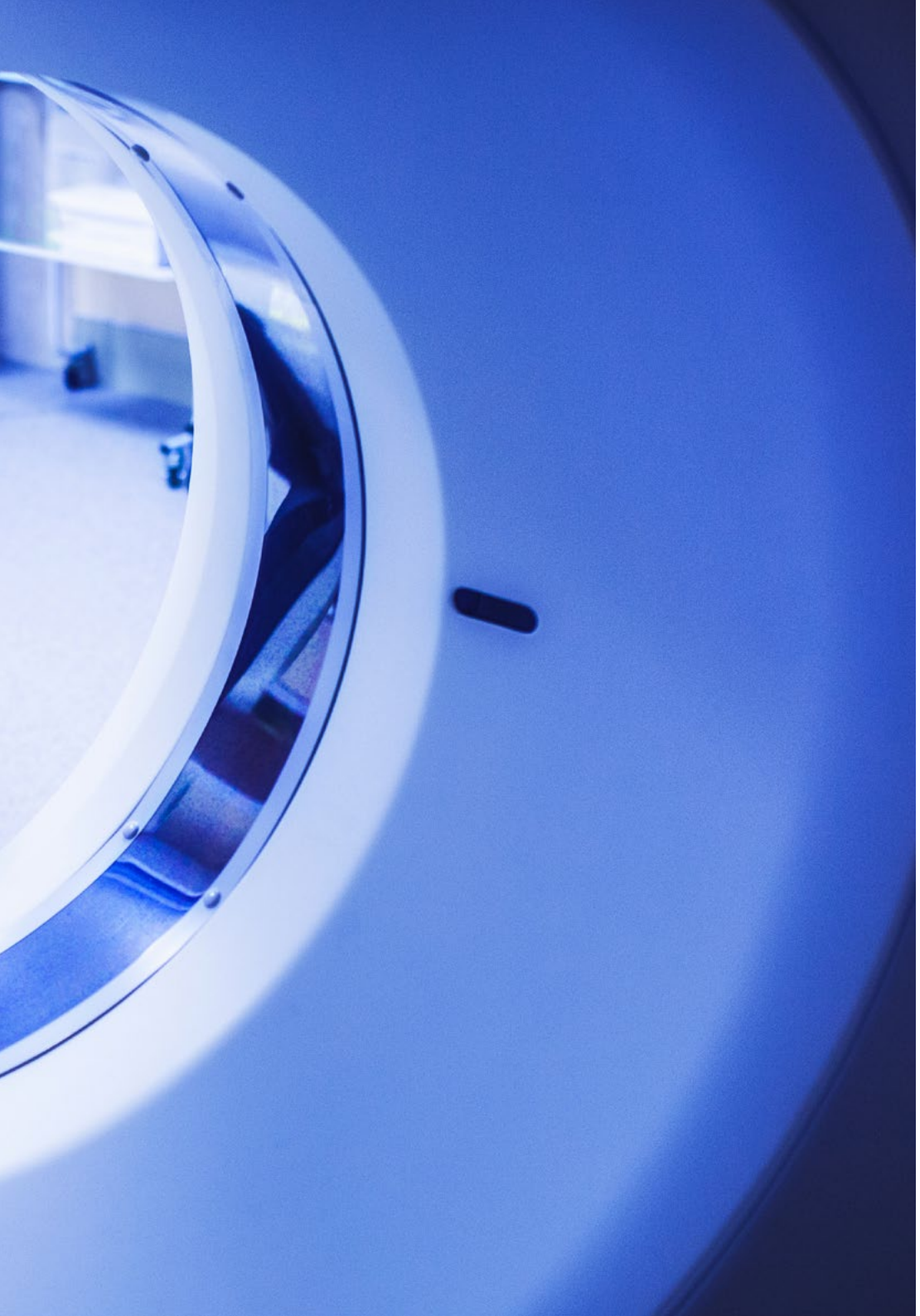
The main objective of this Postgraduate Certificate in Radiophysics in Brachytherapy is to guide graduates towards deepening research and development of new techniques and devices in this area. Designed specifically for engineers, this program will focus on equipping them with the skills necessary to lead innovative initiatives, contributing to technological advancement in the field of brachytherapy. At the end, professionals will not only have strengthened their theoretical understanding, but will also be able to apply practical solutions and contribute to the continuous development of cutting-edge techniques in this specialized field.

Do you want to experience a quality leap in your career? With TECH, you will delve into the different technological innovations in the field of brachytherapy"

General Objectives

- Identify and compare radiation sources used in brachytherapy, demonstrating a thorough understanding of their properties and clinical applications
- Evaluate and inform dose planning in brachytherapy, developing strategies to optimize the distribution of radiation in the target tissue
- Examine and compile relevant clinical outcomes of brachytherapy in different oncological contexts
- Propose and develop specific quality management protocols for brachytherapy procedures, ensuring the safety and efficacy of treatments





Specific Objectives

- Develop source calibration techniques using well and air chambers
- Examine the application of the Monte Carlo method in brachytherapy
- Evaluate planning systems using the TG 43 formalism
- Identify and analyze the key differences between High Dose Rate (HDR) and Low Dose Rate (LDR) Brachytherapy
- Specify procedures and planning for prostate brachytherapy

A syllabus made by specialists and a teaching material of the highest level will be the key to a successful professional career"

03

Course Management

In the creation of the teaching staff of this university program, TECH has brought together the best specialists, with extensive experience and recognized prestige in the field of engineering applied to brachytherapy. Each member of this select team will contribute an extensive professional background, ensuring that graduates receive quality training, backed by practical experience and specialized knowledge in the implementation and optimization of this pioneering technique. In addition, this program has a 100% online format, giving students the opportunity to expand their skills in an agile way and adaptable to their schedules.

You will have the support of a teaching staff formed by distinguished professionals of Medical Engineering"

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, Catholic University San Antonio of Murcia
- Ph.D. 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

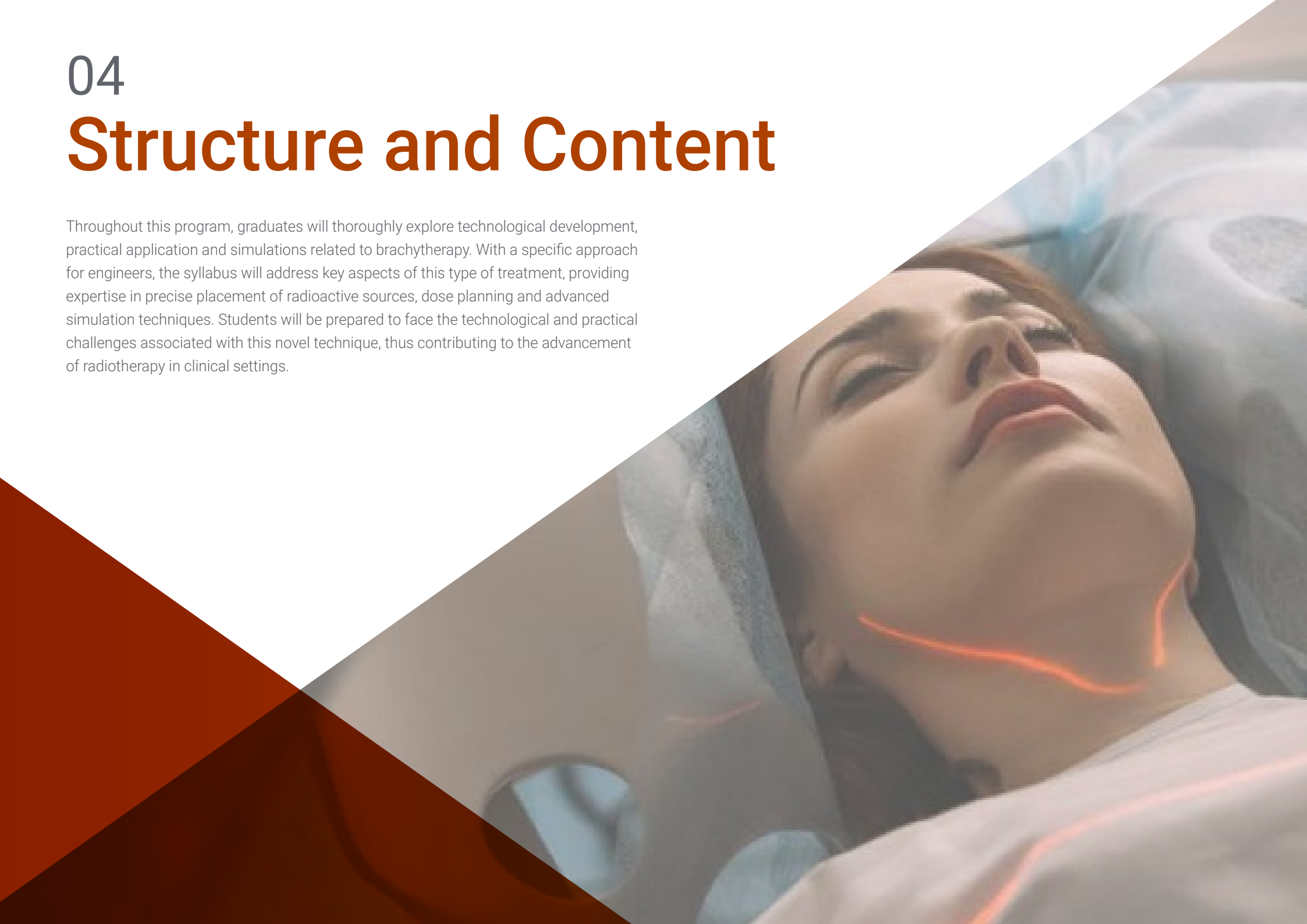
- Radiophysicist at the University Hospital 12 de Octubre
- Medical Physicist at the Beata María Ana Hospital of Hermanas Hospitalarias
- Expert in Radiological Anatomy and Physiology from the Spanish Society of Medical Physics
- Expert in Medical Physics from the International University of Andalusia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

Take the opportunity to learn about the latest advances in this field in order to apply it to your daily practice"

04

Structure and Content

Throughout this program, graduates will thoroughly explore technological development, practical application and simulations related to brachytherapy. With a specific approach for engineers, the syllabus will address key aspects of this type of treatment, providing expertise in precise placement of radioactive sources, dose planning and advanced simulation techniques. Students will be prepared to face the technological and practical challenges associated with this novel technique, thus contributing to the advancement of radiotherapy in clinical settings.



Studying through videos, interactive summaries and evaluation tests, you will assimilate all the physical, biological and radiobiological principles of brachytherapy"

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 in Brachytherapy
- 1.2.3. Calibration of the Sources
- 1.2.4. Safety in the Handling and Storage of Brachytherapy Sources

1.3. Dose Planning in Brachytherapy
- 1.3.1. Dose Planning Techniques 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 for Minimizing Irradiation of Healthy Tissue
- 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. Brachytherapy Applications in the Treatment of Prostate Cancer
- 1.5.2. Brachytherapy in Cervical Cancer: Techniques and Results
- 1.5.3. Brachytherapy in Breast Cancer: Clinical Considerations and Results

1.6. Quality Management in Brachytherapy
- 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 Results in the Treatment of Specific Cancers
- 1.7.2. Evaluation of the Efficacy and Toxicity of Brachytherapy
- 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 of Brachytherapy

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 of Brachytherapy
- 1.10.2. Resolution of Practical Situations and Technical Challenges
- 1.10.3. Evaluation of Treatment Plans and Discussion of Results

Relearning will allow you to learn with less effort and greater performance, getting more involved in your professional specialization"

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"

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"

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

The student will learn to solve complex situations in real business environments through collaborative activities and real cases.

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

> *Our program prepares you to face new challenges in uncertain environments and achieve success in your career"*

The case method is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

Relearning Methodology

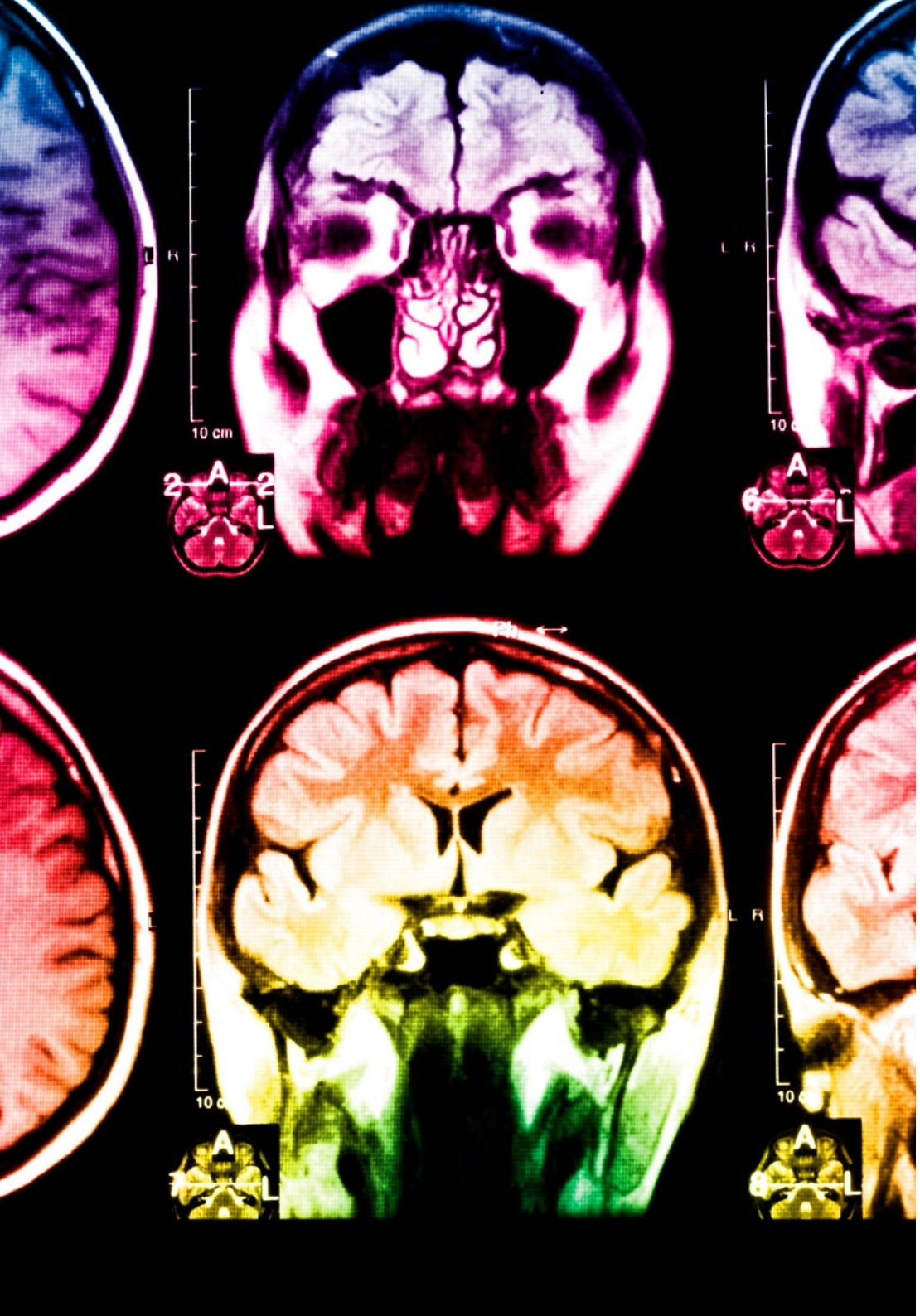
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

In 2019, we obtained the best learning results of all online universities in the world.

At TECH, you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



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. This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

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.

Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

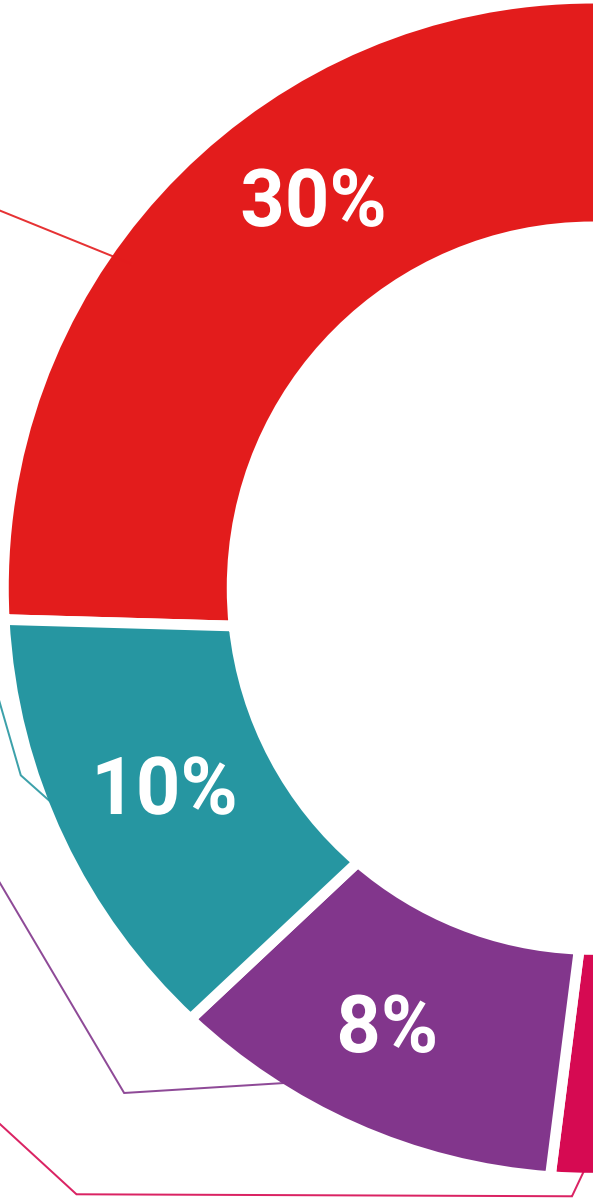
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

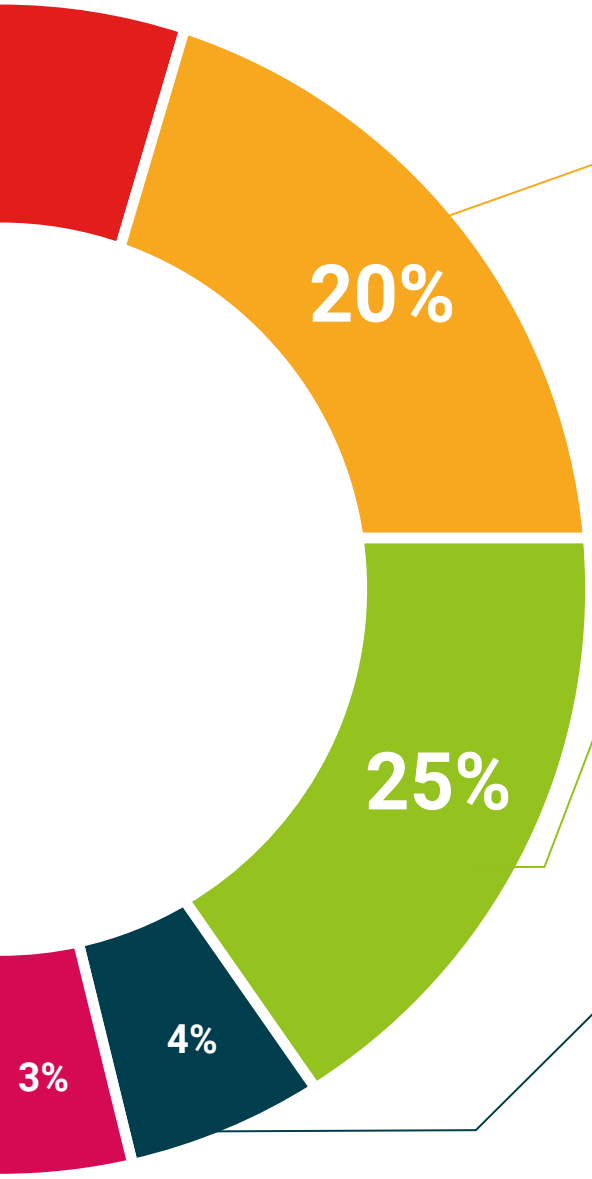
Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.

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.





Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.

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".

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.

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 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 Brachytherapy** contains the most complete and up-to-date educational program in 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 diploma 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 Brachytherapy**

Official Nº of hours: **150 h.**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Awards the following

DIPLOMA

to

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

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Radiophysics in Brachytherapy

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 diploma issued with an apostille, TECH EDUCATION 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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- Duration: **6 weeks**
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Postgraduate Certificate

Radiophysics in Brachytherapy

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