

# Postgraduate Certificate

## Biomedical Imaging Techniques and Intervention in E-Health





## Postgraduate Certificate Biomedical Imaging Techniques and Intervention in E-Health

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

Website: [www.techtute.com/pk/engineering/postgraduate-certificate/biomedical-imaging-techniques-intervention-e-health](http://www.techtute.com/pk/engineering/postgraduate-certificate/biomedical-imaging-techniques-intervention-e-health)

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# 01

# Introduction

The possibilities offered by biomedical imaging are increasing, so knowing how to obtain them, analyze them and how their use works is not only necessary for radiologists, surgeons and related areas, but also for the engineers in charge of their design. With the relevance that Big Data has acquired in recent times in all disciplines, from finance and business to industrial development sectors and, of course, clinical sectors, it is mandatory for the engineer or a related professional operating in the health sector to know the most effective ways to manage data, as well as to know all the operational details related to biomedical images. These issues will be addressed in detail in this program, which also has the most up-to-date syllabus and the most effective teaching methodology in the online educational panorama.



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*Take advantage of all the virtual tools that TECH offers you, delve into the management of biomedical imaging and learn their methods of use in the recognition and intervention of clinical cases with this Postgraduate Certificate”*

The field of biomedical imaging is very extensive. Each type of biomedical imaging not only has a specific way of being obtained and used for surgical or treatment purposes, it also has a specific way of being processed to be useful in medical practice. This program explains in detail each of these techniques and procedures, completely up-to-date in order to offer the best to the interested specialists.

This Postgraduate Certificate has a very practical approach, although it also explains in depth the physical and clinical fundamentals of the types of biomedical imaging seen. It is important for TECH Technological University that the student has a specialized knowledge of the new areas to which this field has expanded, such as nuclear medicine and radiotracer tracking, for example, and the way in which it can continue to evolve in the future.

For its practical approach, this Postgraduate Certificate has a variety of supporting material that efficiently complements the 150 hours of study that make up this program. A rigorous and efficient distribution, a highly specialized teaching team, and dynamic and up-to-date material make this program the best option if you are interested in specializing in recognition in intervention through biomedical imaging.

This **Postgraduate Certificate in Biomedical Imaging Techniques and Intervention in E-Health** contains the most complete and up-to-date educational program on the market. The most important features include:

- ◆ The development of case studies presented by experts in Recognition and Intervention Techniques
- ◆ 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



*Know all the latest developments in biomedical imaging, its process and its use in a completely virtual Postgraduate Certificate"*

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*Biomedical imaging is a very useful tool for different procedures and surgical approaches. Participate in this field of health with the support of TECH Technological University”*

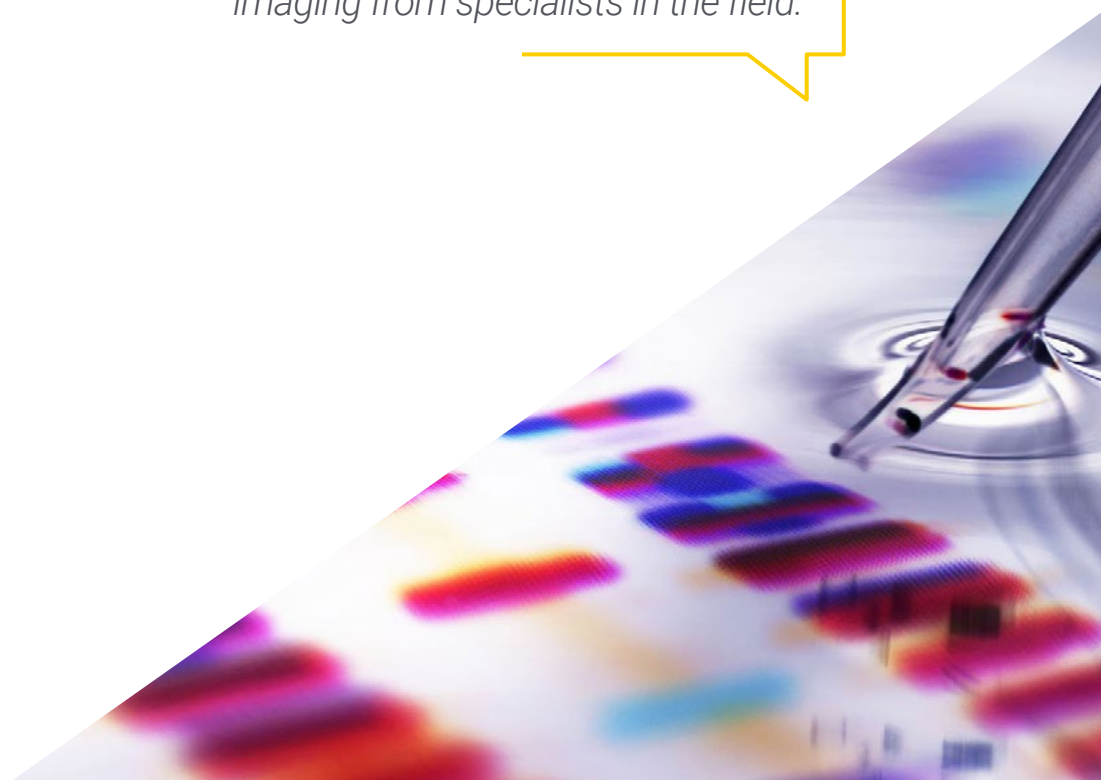
The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide professionals with situated and contextual learning, i.e., a simulated environment that will provide immersive training, designed for training oneself 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 student will be assisted by an innovative interactive video system created by renowned and experienced experts.

*PET allows imaging of the organism in a less invasive way than other tests. Know all the details in this Postgraduate Certificate.*

*Learn how to identify faults and errors in any type of biomedical imaging from specialists in the field.*



02

# Objectives

This program has an adequate approach to teach the student the classification, management and analysis of biomedical imaging, as well as to update them in surgical and other uses that have been developed in the health sector. From the technical details of radiological and ultra sound proceduress to the latest developments in nuclear medicine, this program follows a series of general objectives and structures a rigorous and efficient program.





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*Expand your technical knowledge in the use of biomedical imaging with the highest quality didactic and academic resources possible”*



## General Objectives

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- ◆ Develop key concepts of medicine that serve as a vehicle to understand clinical medicine
- ◆ Examine the ethical and best practice principles governing the different types of research in health sciences
- ◆ Identify the real clinical applications of the various techniques
- ◆ Provide the necessary resources to practically apply all the concepts in the modules
- ◆ Determine the importance of medical databases
- ◆ Determine the different types and applications of telemedicine
- ◆ Delve into the most common ethical aspects and regulatory frameworks of telemedicine
- ◆ Analyze the use of medical devices
- ◆ Collect e-Health success stories and mistakes to avoid



*Learn more about the relationship between new technologies and the most modern Recognition and Intervention Techniques in this Postgraduate Certificate”*





## Specific Objectives

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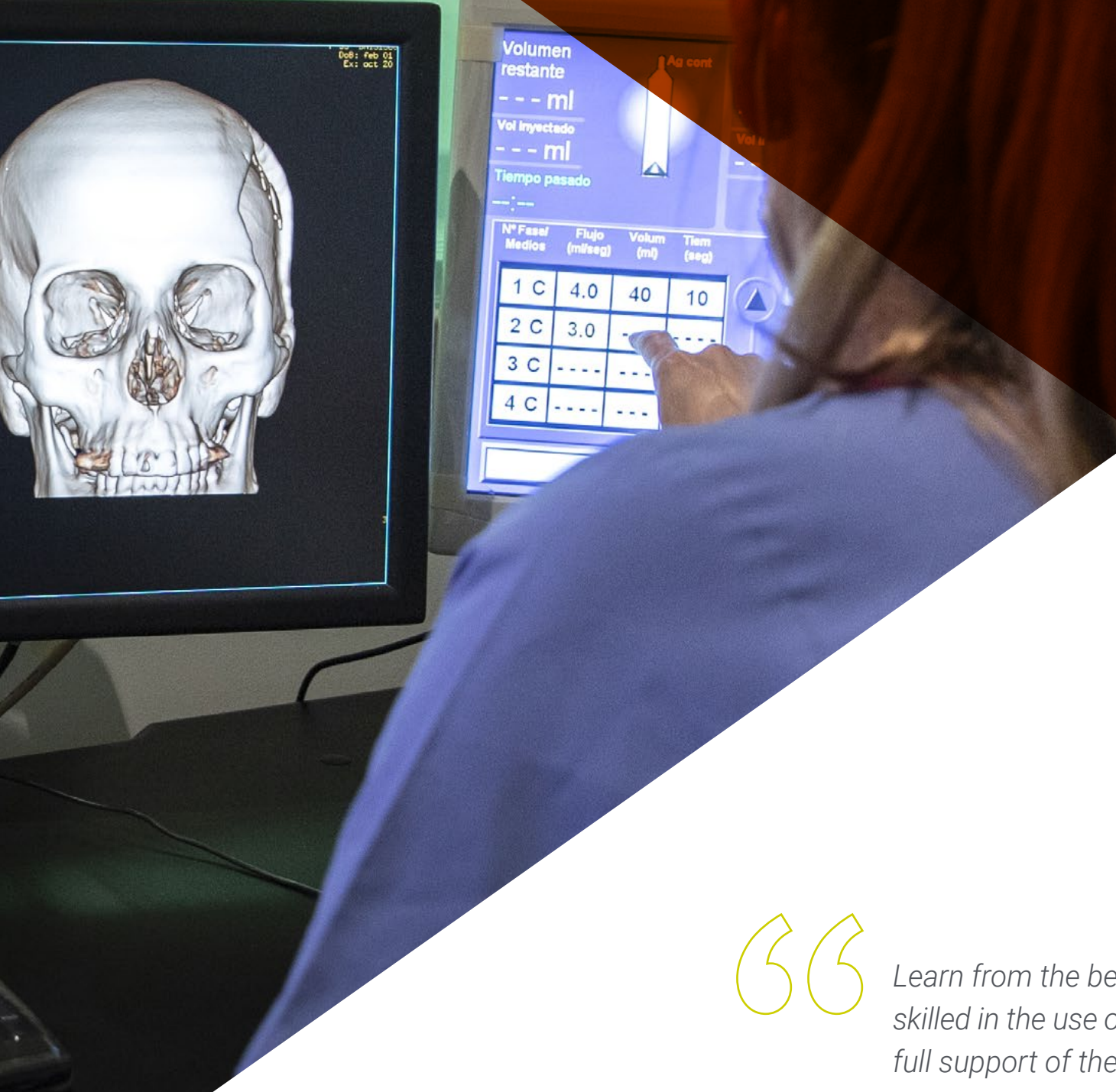
- ◆ Examine the fundamentals of medical imaging technologies
- ◆ Develop expertise in radiology, clinical applications and physical fundamentals
- ◆ Analyze ultrasound, clinical applications and physical fundamentals
- ◆ Delve into tomography, computed and emission tomography, clinical applications and physical fundamentals
- ◆ Determine how to manage magnetic resonance imaging, clinical applications and physical fundamentals
- ◆ Generate advanced knowledge of nuclear medicine, differences between PET and SPECT, clinical applications and physical fundamentals
- ◆ Discriminate noise in the image, reasons for it and image processing techniques to reduce it
- ◆ Present image segmentation technologies and explain their usefulness
- ◆ Gain a deeper understanding of the direct relationship between surgical interventions and imaging techniques
- ◆ Establish the possibilities offered by artificial intelligence in recognizing patterns in medical images, and thus deepen innovation in the field

# 03

# Course Management

Being aware of the importance of the constant advancement and updating of medical intervention techniques, TECH Technological University has assembled a team of professionals to offer the interested public a detailed and up-to-date program on the use of biomedical imaging. The team of specialists that designed this program will make use of the virtual tools that TECH Technological University offers, creating a Postgraduate Certificate of 150 hours complemented with a large amount of information that will be of immense help to the student.





Volumen restante  
--- ml  
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Tiempo pasado  
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Nº Fase/ Medios	Flujo (ml/seg)	Volum (ml)	Tiempo (seg)
1 C	4.0	40	10
2 C	3.0	-	-
3 C	---	---	---
4 C	---	---	---

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*Learn from the best. Delve deeper and become skilled in the use of biomedical imaging with the full support of the teaching staff of TECH”*

## Management



### Ms. Sirera Pérez, Ángela

- ♦ Biomedical Engineer expert in Nuclear Medicine and exoskeleton design
- ♦ Designer of specific parts for 3D printing at Technadi
- ♦ Technician in the Nuclear Medicine area of the University Clinic of Navarra
- ♦ Degree in Biomedical Engineering from the University of Navarra
- ♦ MBA and Leadership in Healthcare and Medical Technology Companies



# 04

# Structure and Content

This program is designed and organized according to the characteristics of each type of biomedical imaging and the technical requirements to understand their principles, operation, method of obtaining, analysis and clinical application, in addition to all the protocol-medical and legal details of the corresponding procedures. This Postgraduate Certificate also offers specialized knowledge in nuclear medicine and aims for the student to understand the current relationship between surgical interventions and the analysis of biomedical imaging. The program will be accomplished with the help of a large amount of dynamic and theoretical virtual content to which the student will have full access.







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*An excellent syllabus to delve into the management of biomedical imaging in an accurate and up-to-date format”*

**Module 1. Techniques, Recognition and Intervention using Biomedical Imaging**

- 1.1. Medical Imaging
  - 1.1.1. Modalities in Medical Imaging
  - 1.1.2. Objectives in Medical Imaging Systems
  - 1.1.3. Medical Imaging Storage Systems
- 1.2. Radiology
  - 1.2.1. Imaging Method
  - 1.2.2. Radiology Interpretation
  - 1.2.3. Clinical Applications
- 1.3. Computed Tomography (CT)
  - 1.3.1. Principle of Operation
  - 1.3.2. Image Generation and Acquisition
  - 1.3.3. Computerized Tomography. Typology
  - 1.3.4. Clinical Applications
- 1.4. Magnetic Resonance Imaging (MRI)
  - 1.4.1. Principle of Operation
  - 1.4.2. Image Generation and Acquisition
  - 1.4.3. Clinical Applications
- 1.5. Ultrasound: Ultrasound and Doppler Sonography
  - 1.5.1. Principle of Operation
  - 1.5.2. Image Generation and Acquisition
  - 1.5.3. Typology
  - 1.5.4. Clinical Applications
- 1.6. Nuclear medicine
  - 1.6.1. Physiological Basis in Nuclear Studies. Radiopharmaceuticals and Nuclear Medicine
  - 1.6.2. Image Generation and Acquisition
  - 1.6.3. Types of Tests
    - 1.6.3.1. Gammagraphy
    - 1.6.3.2. SPECT
    - 1.6.3.3. PET:
    - 1.6.3.4. Clinical Applications





- 1.7. Image-Guided Interventions
  - 1.7.1. Interventional Radiology
  - 1.7.2. Interventional Radiology Objectives
  - 1.7.3. Procedures
  - 1.7.4. Advantages and Disadvantages
- 1.8. Image Quality
  - 1.8.1. Technique
  - 1.8.2. Contrast
  - 1.8.3. Resolution
  - 1.8.4. Noise
  - 1.8.5. Distortion and Artifacts
- 1.9. Medical Imaging Tests. Biomedicine
  - 1.9.1. Creating 3D Images
  - 1.9.2. Biomodels
    - 1.9.2.1. DICOM Standard
    - 1.9.2.2. Clinical Applications
- 1.10. Radiological Protection
  - 1.10.1. European Legislation Applicable to Radiology Services
  - 1.10.2. Safety and Action Protocols
  - 1.10.3. Radiological Waste Management
  - 1.10.4. Radiological Protection
  - 1.10.5. Care and Characteristics of Rooms

“*Learn all the theoretical, technical and practical issues of biomedical imaging in this Postgraduate Certificate created by TECH for you*”

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"*

## 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 Biomedical Imaging Techniques and Intervention in E-Health guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.





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*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork”*

This **Postgraduate Certificate in Biomedical Imaging Techniques and Intervention in E-Health** contains the most complete and up-to-date program on the market.

After students have 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 Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Biomedical Imaging Techniques and Intervention in E-Health**

Official N° of Hours: **150 h.**



\*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.

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



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