

# Postgraduate Certificate

Diagnostic Imaging  
in Emergency and  
Critical Care





## Postgraduate Certificate Diagnostic Imaging in Emergency and Critical Care

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

Website: [www.techtitute.com/pk/medicine/postgraduate-certificate/diagnostic-imaging-emergency-critical-care](http://www.techtitute.com/pk/medicine/postgraduate-certificate/diagnostic-imaging-emergency-critical-care)

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# 01

# Introduction

Imaging techniques are of enormous importance in the field of emergencies, since they serve to generate a first diagnosis and subsequently initiate treatment. This program is a compilation of knowledge that allows those who study it to deepen their knowledge the various diagnostic techniques and protocol, so that the medical professional will be able to work more quickly in these emerging cases. A 100% online program, without pre-established timetables or laborious paperwork.





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*Improve your knowledge through this program, where you will find the best didactic material with real clinical cases. Learn about the latest advances in the specialty to be able to provide excellent medical care"*

Professional physicians and those involved in the field of emergency medicine have always had to provide rapid solutions to problems. Therefore, imaging diagnostics represent a more than significant value in the process.

That is why TECH has developed this course in order to provide the most relevant updates in the medical sector, this to streamline the diagnostic processes and in turn to be more effective in the execution of the treatment to be followed.

This knowledge will have an impact on each of the six fundamental domains of the current concept of quality of care: patient safety, effectiveness, efficiency, equity, opportunity and humanization.

It is a 100% online program that doesn't involve fixed timetables or face-to-face classes, so the professional will be able to organize their own time to studying this Postgraduate Certificate.

This **Postgraduate Certificate in Diagnostic Imaging in Emergency and Critical Care** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ More than 75 clinical cases presented by experts in clinical imaging
- ♦ 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
- ♦ Diagnostic and therapeutic developments in assessment, diagnosis and intervention in Diagnostic Imaging for Emergency and Critical Care
- ♦ Practical exercises where the self-evaluation process can be carried out to improve learning
- ♦ Clinical iconography and diagnostic image tests
- ♦ An algorithm-based interactive learning system for decision-making in the clinical situations presented throughout the course
- ♦ Special emphasis on evidence-based medicine and clinical imaging research methodologies for emergency and critical care
- ♦ All of this will be complemented by 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



*This program will provide students with a sense of confidence in medical practice, which will help them grow personally and professionally”*

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*This Postgraduate Certificate is the best investment you can make when selecting a refresher program, for two reasons: in addition to updating your knowledge in Diagnostic Imaging in Emergency and Critical Care, you will obtain a qualification from TECH Technological University"*

The teaching staff includes professionals from the field of Diagnostic Imaging in Emergency and Critical Care who bring their experience to this training program, as well as renowned specialists from leading scientific societies.

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 an immersive academic experience programmed to learn in real situations.

This program is designed around Problem-Based Learning, whereby the physician must try to solve the different professional practice situations that arise throughout the program. For this purpose, the physician will be assisted by an innovative interactive video system created by renowned and experienced experts in the field of Diagnostic Imaging in Emergency and Critical Care with extensive teaching experience.

*Increase your decision-making confidence by updating your knowledge through this Postgraduate Certificate.*

*Make the most of this opportunity to learn about the latest advances in Diagnostic Imaging in Emergency and Critical Care and improve your patient care.*



# 02 Objectives

The Postgraduate Certificate in Diagnostic Imaging in Emergency and Critical Care is aimed at enhancing the physician's ability to diagnose and treat patients in emergency or intensive care situations.







*This Postgraduate Certificate is designed to help you update your knowledge in Diagnostic Imaging in Emergencies and Intensive Care, with the use of the latest educational technology, to contribute with quality and confidence to decision-making, diagnosis, treatment, and patient support"*



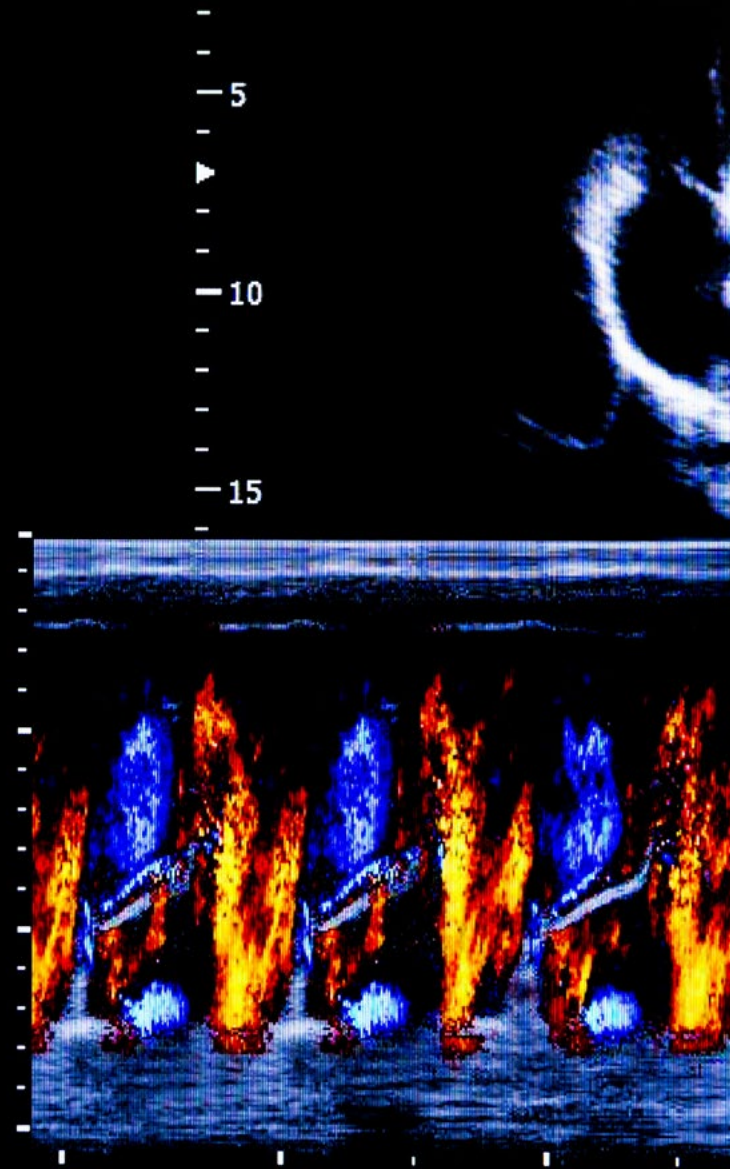
## General Objective

- The general objective of the Postgraduate Certificate in Diagnostic Imaging for Emergency and Critical Care is to complete the process of making physicians experts in the use of imaging techniques, allowing them to deal with emergency situations and critical patients, regardless of the environment in which they find themselves.



*Update your knowledge through this Postgraduate Certificate in Diagnostic Imaging in Emergency and Critical Care”*

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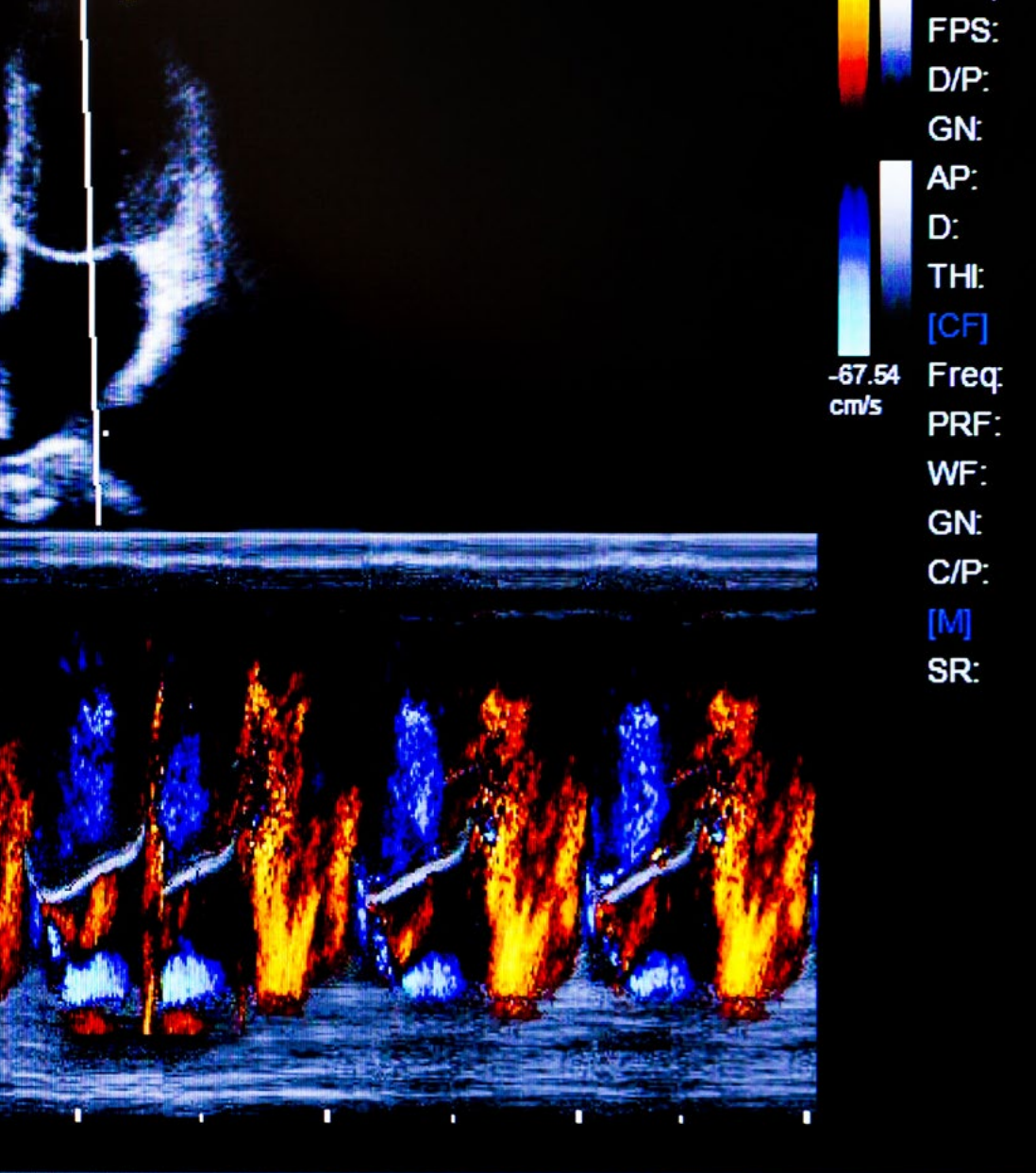
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## Specific Objectives

- Describe the fundamental diagnostic imaging techniques
- Explain the parameters to consider in conventional radiology
- Explain the characteristics of image quality and artifacts in conventional radiology
- Define the parameters that guarantee patient safety
- Define the parameters that guarantee safety of professionals
- Define the physical principles involved in ultrasound imaging
- Establish an appropriate ultrasound sequence for each examination
- Explain the ultrasound modes
- Define the different types of ultrasound and their applications
- Describe the different ultrasound planes
- Explain the principles of echonavigation
- Define the physical principles involved in computerized tomography
- Define the physical principles involved in magnetic resonance
- Identify artifacts in magnetic resonance imaging
- Define the physical principles involved in digital angiography
- Define the material required for digital angiography
- Define the physical principles involved in nuclear medicine
- Describe the principles of radiation protection and radiopharmaceuticals

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Layout

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03

# Course Management

The program's teaching staff includes leading specialists in Diagnostic Imaging in Emergency and Critical Care who contribute their years of work experience to this program. Additionally, other recognized specialists participate in its design and preparation, which means that the program is developed in an interdisciplinary manner.





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*Learn the latest advances in Diagnostic Imaging in Emergency and Critical Care procedures from leading professionals”*

## International Guest Director

Dr. Hamid Shokoohi is one of the leading international figures in the scientific study of emergency and critical care ultrasound. His extensive career has led him to practice as an **attending physician in the Emergency Department of the Massachusetts General Hospital** and to be in charge of the direction of the **Emergency Ultrasound study areas and the Ultrasound Ultrasound division** of this same first level health space.

With more than 150 publications in high impact journals, Shokoohi has become one of the most prestigious specialists in **clinical ultrasound**. His presence at national and international congresses raises the level of competence of the rest of the attending professionals and attracts numerous experts in his field.

As a result of his excellent research work, he has been recognized by organizations such as the AEUS, which has awarded him the **Titan in Research Award or the Teaching Excellence Award** for his academic and research contribution. In addition, he directs the MGH Emergency Ultrasound Fellowship Program, which was also awarded the Stellar Clinical Ultrasound Fellowship Program Award.

The clinical use of ultrasound in the care of patients with shock and respiratory distress, the safety and efficacy of ultrasound-guided procedures are some of the fields in which he has set his study. At the same time, his interest in innovation has led him to seek innovative applications for ultrasound or the use of AI in these devices.

Likewise, in his professional career, high-level education has been part of his daily life. In this regard, Hamid Shokoohi is an Associate Professor of Emergency Medicine at Harvard University and GWU. This superb professional encourages the creation of specific training for physicians to improve their diagnostic skills and abilities.



## Dr. Shokoohi, Hamid

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- Médico adjunto de Urgencias del Massachusetts General Hospital
- Attending physician in the Emergency Department at Massachusetts General Hospital
- Attending Physician Wound Care and Hyperbaric Medicine Center at GWU
- Attending Physician in Emergency Medicine at GWU
- Director of the Harvard Emergency Fellowship (Ultrasound Fellowship at MGB)
- Director of Emergency Ultrasound Research at Massachusetts General Hospital
- Director of International Clinical Ultrasound at Massachusetts General Hospital
- Associate Director, Division of Ultrasound Ultrasound at Massachusetts General Hospital
- Councilor of the Executive Board of the Society of Clinical Ultrasound Fellowships (SCUF)
- Chair of the SAEM Academic Professional Development Task Force.
- Member of: SCUF Education Committee Society of Clinical Ultrasound Fellowships, American College of Emergency Physicians, American Institute of Ultrasound in Medicine, American Registry of Diagnostic Medical Sonography.

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*Thanks to TECH, you will be able to learn with the best professionals in the world”*

## Management



### Dr. Álvarez Fernández, Jesús Andrés

- ♦ Attending Physician of Intensive Care Medicine and Major Burns Unit. Getafe University Hospital
- ♦ Degree in Medicine and Surgery
- ♦ Specialist in Intensive Care Medicine
- ♦ Doctor of Medicine (PhD)
- ♦ Attending Physician of Intensive Care Medicine and Major Burns Unit. Getafe University Hospital. Getafe, Madrid
- ♦ Creator and Director of the Fundamentals of Ultrasonography Course Program - FUS Courses
- ♦ Founding Member of the Ecoclub of SOMIAMA
- ♦ Collaborating Professor of SOCANECO

## Professors

### Dr. Benito Vales, Salvador

- ♦ Head of Emeritus Service. Emergency Department. Santa Cruz and San Pablo Hospital Barcelona
- ♦ Specialist in Internal Medicine and Intensive Medicine
- ♦ Professor of Medicine Autonomous University of Barcelona – UAB

### Dr. Martínez Crespo, Javier

- ♦ Radiodiagnosis Specialist at the Radiodiagnostic Department, Getafe University Hospital
- ♦ Radiodiagnostic Service
- ♦ Getafe University Hospital. Getafe, Madrid
- ♦ Associate Professor at the European University of Madrid

### Dr. Costa Subias, Joaquín

- ♦ Radiodiagnosis Specialist
- ♦ Degree in Medicine (MD)
- ♦ Head of the Radiodiagnostics Department Getafe University Hospital. Madrid
- ♦ Associate Professor at the European University of Madrid

### Dr. Angulo Cuesta, Javier

- ♦ Specialist in Urology
- ♦ Degree in Medicine (MD) and PhD in Medicine
- ♦ Urology Department. Getafe University Hospital. Madrid
- ♦ Professor at the European University of Madrid





**Dr. Turbau Valls, Miquel**

- ◆ Specialist in Internal Medicine
- ◆ Degree in Medicine (MD)
- ◆ Emergency Department. Santa Creu and Sant Pau University Hospital Barcelona

**Dr. Moliné Pareja, Antoni**

- ◆ Degree in Medicine (MD)
- ◆ Specialist in Internal Medicine
- ◆ Emergency Department. Santa Creu and Sant Pau University Hospital Barcelona

**Dr. León Ledesma, Raquel**

- ◆ Degree in Medicine (MD)
- ◆ Specialist in Obstetrics and Gynecology and in General and Digestive Surgery
- ◆ General and Digestive System Surgery Department. Getafe University Hospital. Madrid

**Dr. Jiménez Ruiz, Ahgiel**

- ◆ Medical Surgeon
- ◆ Specialist in Medical and Surgical Emergencies and Critical Medicine  
Fellow in Renal Transplants
- ◆ Emergency Department. 25 IMSS Regional General Hospital. Mexico City, Mexico

**Dr. Igeño Cano, José Carlos**

- ◆ Head of the Emergency and Intensive Care Unit
- ◆ San Juan de Dios Hospital. Córdoba

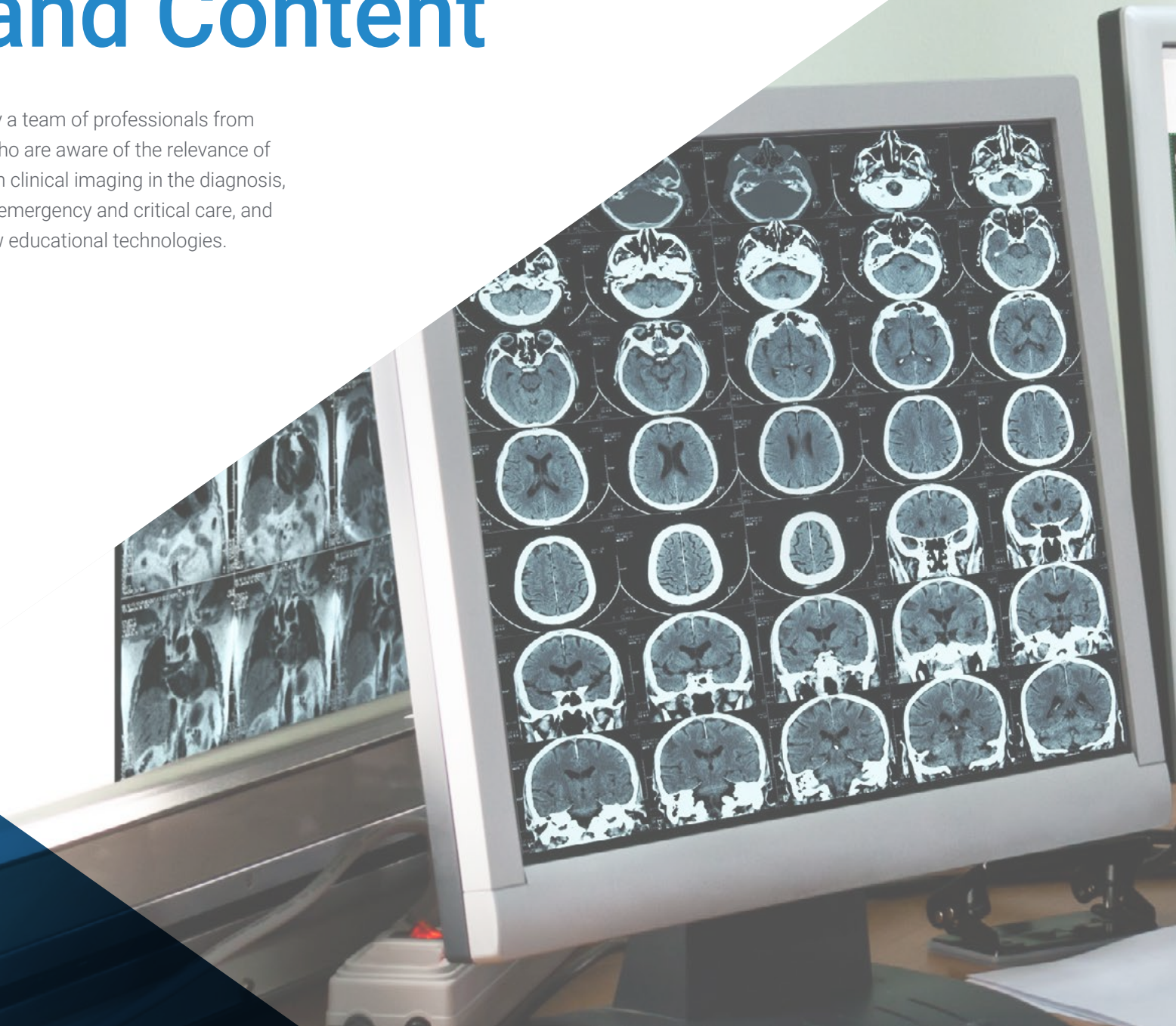
**Mr. Soria Jerez, Juan Alfonso**

- ◆ Degree in Radiology
- ◆ Specialist Technician in Radiodiagnosis
- ◆ Radiodiagnostic Service Getafe University Hospital. Madrid
- ◆ Secretary General of the Spanish Association of Radiology, Radiotherapy and Nuclear Medicine Technicians (AETR)

# 04

# Structure and Content

The structure of the contents has been designed by a team of professionals from the best hospitals and universities in the country, who are aware of the relevance of up-to-date education to be able to intervene through clinical imaging in the diagnosis, treatment and monitoring of diagnostic imaging in emergency and critical care, and who are committed to quality teaching through new educational technologies.





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*This Postgraduate Certificate in Diagnostic Imaging in Emergency and Critical Care contains the most complete and up-to-date scientific program on the market”*

## Module 1. Fundamental Diagnostic Imaging Techniques

- 1.1. Conventional Radiology (CR)
  - 1.1.1. Physical Radiology
  - 1.1.2. X-ray Beam
  - 1.1.3. Analog Radiology
  - 1.1.4. Digital Radiology
  - 1.1.5. Image Quality and Artifacts
  - 1.1.6. Conventional Radiology Equipment
  - 1.1.7. Patient Safety
  - 1.1.8. Radiobiology and Radiological Protection
- 1.2. Ultrasound
  - 1.2.1. Physical Principles
  - 1.2.2. Image Formation in B Mode
  - 1.2.3. Transducers and Imaging
  - 1.2.4. Ultrasound Equipment
  - 1.2.5. Parameters Dependent on the Operator and Artifacts
  - 1.2.6. Quality and Safety for Patients in Ultrasound
- 1.3. Computed Tomography (CT)
  - 1.3.1. Physical Principles
  - 1.3.2. CT Equipment
  - 1.3.3. Image Acquisition
  - 1.3.4. Image Construction
  - 1.3.5. Quality
  - 1.3.6. Post-Process
  - 1.3.7. CT Patients Safety
  - 1.3.8. Radiological Protection in High Doses
- 1.4. Magnetic Resonance Imaging (MRI)
  - 1.4.1. Physical Principles
  - 1.4.2. Tissue Contrast
  - 1.4.3. MRI Equipment
  - 1.4.4. Obtaining an Image and its Formation
  - 1.4.5. Sequences
  - 1.4.6. Artefacts
  - 1.4.7. MRI Patients Safety



- 1.5. Digital Angiography
  - 1.5.1. Physical Principles
  - 1.5.2. Digital Angiography Equipment
  - 1.5.3. Materials and Contrast Media
  - 1.5.4. Acquisition and Construction of the Image
  - 1.5.5. Digital Subtraction, Masks and Road Map
  - 1.5.6. Radiological Protection in High Doses
- 1.6. Nuclear medicine
  - 1.6.1. Physical Principles
  - 1.6.2. Gamma Cameras
  - 1.6.3. PET and SPET Equipment
  - 1.6.4. Hybrid Equipment
  - 1.6.5. Image Quality and Acquisition
  - 1.6.6. Radiological Protections and Radiopharmacology

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*A unique, key, and decisive educational experience to boost your professional development”*

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 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.



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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. 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 Diagnostic Imaging in Emergency and Critical Care 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 Diagnostic Imaging in Emergency and Critical Care** 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 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 Diagnostic Imaging in Emergency and Critical Care**  
Official N° of Hours: **150 h.**



\*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.



future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
online training  
development language  
virtual classroom



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