

# Postgraduate Diploma

Ultrasonographic Approach to  
Major Syndromes and Ultrasound-  
Guided Procedures for Nursing





## Postgraduate Diploma Ultrasonographic Approach to Major Syndromes and Ultrasound-Guided Procedures for Nursing

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

Website: [www.techtute.com/us/nursing/postgraduate-diploma/postgraduate-diploma-ultrasonographic-approach-major-syndromes-ultrasound-guided-procedures-nursing](http://www.techtute.com/us/nursing/postgraduate-diploma/postgraduate-diploma-ultrasonographic-approach-major-syndromes-ultrasound-guided-procedures-nursing)

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01

# Introduction

The ultrasonographic approach is a very useful technique that enables ultrasound-guided procedures to be followed more effectively, since the healthcare professional has a live image of the area being worked on. This Postgraduate Diploma is specifically designed for nurses to acquire the necessary competencies for the use of this new tool.



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*Nurses with extensive knowledge in the use of ultrasound will be qualified to participate in the care of critically ill patients"*

Nursing professionals work in different areas and, in the case of emergency and critical care, it is essential that they have perfect knowledge of the ultrasonographic approach to major syndromes and ultrasound-guided procedures, which will enable them to perform their work more effectively. Specifically, by studying this specialization they will be trained in the use of ultrasound devices in the management of emergency and critical care situations.

It must be taken into account that clinical ultrasound is a tool that helps to diagnose and treat patients in emergency situations or with intensive care needs. Today, it is one of the most popular and valuable tools for guiding diagnostic and therapeutic interventions. In addition, it has the advantages of portability, accuracy, real-time display, reproducibility and efficiency.

Technological advances have made it possible to reduce the size of the equipment, making it cheaper and more portable, and have increased the capacity of clinical ultrasound, leading to a notable increase in its applications. Today, more accurate ultrasound diagnosis, safe ultrasound-guided interventions, precise non-invasive hemodynamic evaluations and rapid assessment of traumatic injuries are all possible.

In this Postgraduate Diploma, TECH offers students the most complete training on clinical ultrasound, specifying their use in the care of patients who find themselves in emergency situations or those who need intensive care. Additionally, as it is a 100% online training, the student will have the opportunity to combine their studies with the rest of their daily obligations, so that they will be able to improve their training in a comfortable way.

This **Postgraduate Diploma in Ultrasonographic Approach to Major Syndromes and Ultrasound-Guided Procedures for Nursing** contains the most complete and up-to-date scientific program on the market. The most important features of the specialization are:

- Clinical cases presented by experts in clinical ultrasound in emergencies and intensive care
- 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
- Latest information on ultrasound approach to major syndromes and ultrasound-guided procedures
- Practical exercises where self-assessment can be used to improve learning
- An algorithm-based interactive learning system for decision-making in the clinical situations presented throughout the course
- 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



*Technological advances have led to improved ultrasound scanners, which are becoming more useful and can be used in more situations"*

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*This Postgraduate Diploma is the best investment you can make in choosing a specialization course for two reasons: you will acquire the best and most up-to-date training in Ultrasonographic Approach to Major Syndromes and Ultrasound-Guided Procedures for Nursing, and you will obtain a Postgraduate Diploma issued by TECH Technological University”*

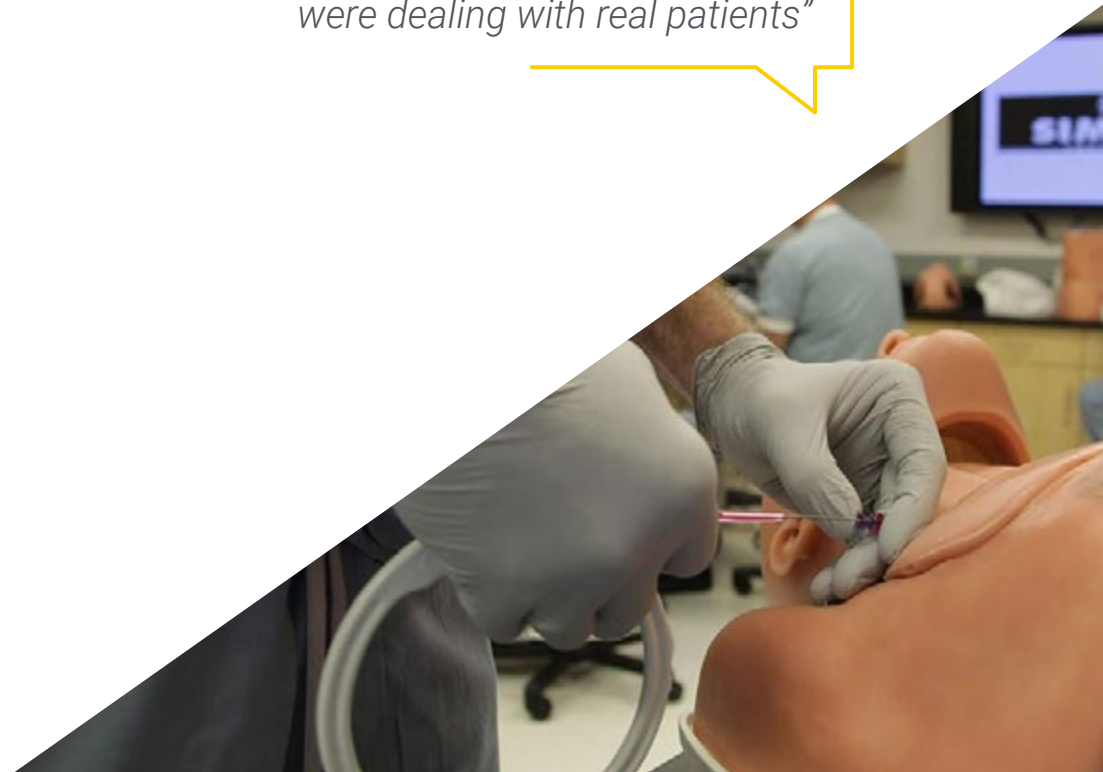
The teaching staff includes professionals from the field of clinical ultrasound, who bring their experience to this training program, as well as renowned specialists from leading scientific societies.

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 training program designed to train 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 throughout the program. For this, the professional will be assisted by an innovative interactive video system developed by recognized experts in the field of Ultrasonographic Approach to Major Syndromes and Ultrasound-Guided Procedures for Nursing, with extensive teaching experience.

*Our trainings have the best teaching methodology and the latest didactic tools, which will allow you to study from home, but without losing the possibilities offered by on-site classes”*

*We offer you the opportunity to study with a multitude of practical cases in such a way that you can learn new skills as if you were dealing with real patients”*



# 02

# Objectives

This Postgraduate Diploma in Ultrasonographic Approach to Major Syndromes and Ultrasound-Guided Procedures for Nursing is aimed at enhancing the nurse's ability to treat patients in emergency or intensive care situations.





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*Our goal is to offer our students the most complete training on the market so that they are able to excel and broaden their knowledge and, therefore, become more efficient in their profession"*



### General Objective

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- Update nurses' knowledge in the use of ultrasound in emergency situations and with critically ill patients, regardless of the situation in which they find themselves.

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*Acquire the most up-to-date knowledge in this field of work and apply advanced protocols in this intervention in your day-to-day work"*





## Specific Objectives

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### Module 1. Ultrasound Imaging

- ◆ Define the physical principles that are involved in ultrasound imaging
- ◆ Establish an appropriate ultrasound sequence for each examination of a patient
- ◆ Explain the different ultrasound modes
- ◆ Define the different types of ultrasound and their applications
- ◆ Describe the different ultrasound maps
- ◆ Explain the principles of eonavigation

### Module 2. Ultrasonographic Approach to Major Syndromes

- ◆ Explain the use of ultrasounds in cardiac arrest
- ◆ Describe the use of ultrasound in cases of shock
- ◆ Explain the use of ultrasounds in respiratory failure
- ◆ Describe the use of ultrasound in cases of sepsis
- ◆ Explain the use of ultrasounds in abdominal pain
- ◆ Describe the use of ultrasound in trauma cases
- ◆ Explain the use of ultrasounds in strokes

### Module 3. Ultrasound-Guided Procedures

- ◆ Explain the process of performing ultrasound-guided intubation
- ◆ Describe the technique for vascular cannulation using ultrasound
- ◆ Explain the process of performing thoracentesis using ultrasound
- ◆ Describe the technique of ultrasound-guided pericardiocentesis
- ◆ Explain the process of performing paracentesis with ultrasound support
- ◆ Explain the process of performing ultrasound-guided lumbar puncture
- ◆ Describe the technique for performing ultrasound-guided drainage and probing

04

# Course Management

The teaching staff includes prestigious and renowned medical specialists, Professional Master's Degree and university experts, with numerous publications, teaching and professional experience in numerous hospitals, where many of the diseases studied have a high morbimortality. The team of professors is comprised by a multidisciplinary team from several medical specialties, such as Internal Medicine, Family Medicine, Palliative Medicine, Preventive Medicine and Nursing, among others.



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*Leading experts in the field are  
at the best university to help you  
achieve professional success”*

## Management



### Dr. Álvarez Fernández, Jesús Andrés

- Doctor of Medicine (PhD)
- Degree in Medicine and Surgery
- Specialist in Intensive Care Medicine.
- Attending Physician of Intensive Care Medicine and Major Burns University, Getafe University Hospital (Madrid)
- Collaborating Professor of the Master's Degree in Update on Intensive Care Medicine at the CEU Cardenal Herrera University of Valencia.
- Founding Member of the Ecoclub of SOMIAMA
- Collaborating Professor of SOCANECO

## Professors

### Dr. Igeño Cano, José Carlos

- ♦ Degree in Medicine and Surgery
- ♦ Specialist in Intensive Care Medicine.
- ♦ Head of Intensive Care and Emergency Services.
- ♦ San Juan de Dios Hospital, Cordoba
- ♦ Creator and Director of Course of Ultrasound-guided Venous Canalization (CAVE)

### Dr. Abril Palomares, Elena

- ♦ Degree in Medicine and Surgery
- ♦ Specialist in Intensive Care Medicine.
- ♦ Attending Physician of Intensive Care Medicine and Major Burns Unit.
- ♦ University Hospital of Getafe, Madrid, Spain
- ♦ Member of the Ecoclub of SOMIAMA.

**Dr. Hernández Tejedor, Alberto**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Intensive Care Medicine.
- ◆ Attending Physician in Intensive Medicine.
- ◆ Alcorcón University Hospital Foundation( Madrid)
- ◆ Member of the Ecoclub of SOMIAMA.

**Dr. López Cuenca, Sonia**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Intensive Care Medicine.
- ◆ Attending Physician of Intensive Care Medicine and Major Burns Unit.
- ◆ University Hospital of Getafe, (Madrid)
- ◆ Member of the Ecoclub of SOMIAMA.

**Dr. Núñez Reiz, Antonio**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Intensive Care Medicine.
- ◆ Attending Physician in Intensive Medicine.
- ◆ San Carlos Clinical University Hospital, Madrid.
- ◆ Collaborating Professor in the Specialist Degree in Thoracic Ultrasound at the Autonomous University of Barcelona.
- ◆ Founding Member and Attending Coordinator of the Ecoclub of SOMIAMA.
- ◆ Collaborating Professor of SOCANECO

**Dr. Palacios Ortega, Francisco de Paula**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Intensive Care Medicine.
- ◆ Attending Physician of Intensive Care Medicine and Major Burns Unit.
- ◆ University Hospital of Getafe, (Madrid). Collaborating Professor at the University of Murcia
- ◆ Founding Member of the Ecoclub of SOMIAMA

**Dr. Temprano Vázquez, Susana**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Intensive Care Medicine.
- ◆ Attending Physician in Intensive Care Medicine.
- ◆ 12 de Octubre University Hospital, Madrid
- ◆ Founding Member of the Ecoclub of SOMIAMA



04

# Structure and Content

The structure of the contents has been designed by a team of professionals from the best educational hospital and universities in the country, who are aware of the relevance of up-to-date, training, and are committed to quality teaching using new educational technologies.





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*We have the most complete and up-to-date academic program in the market. We strive for educational excellence and we want you to achieve it too"*

## Module 1. Ultrasound Imaging

- 1.1. Physical Principles |
  - 1.1.1. Sounds and Ultrasound
  - 1.1.2. Nature of Ultrasound
  - 1.1.3. Interaction of Ultrasound with Matter
  - 1.1.4. Concept of Ultrasound
  - 1.1.5. Ultrasound Safety
- 1.2. Ultrasound Sequence
  - 1.2.1. Ultrasound Emission
  - 1.2.2. Tissue Interaction
  - 1.2.3. Echo Formation
  - 1.2.4. Echo Reception
  - 1.2.5. Ultrasound Image Generation
- 1.3. Ultrasound Modes
  - 1.3.1. Mode A
  - 1.3.2. M-Mode
  - 1.3.3. Mode B
  - 1.3.4. Color Doppler
  - 1.3.5. Angio-Doppler
  - 1.3.6. Spectral Doppler
  - 1.3.7. Combined Modes
  - 1.3.8. Other Modalities and Techniques
- 1.4. Ecography
  - 1.4.1. Console Ecograph Ultrasound Scanners
  - 1.4.2. Portable Ecograph Ultrasound scanners
  - 1.4.3. Specialized Ecograph Ultrasound Scanners
  - 1.4.4. Transducers
- 1.5. Ultrasound Maps and Eco Navigation
  - 1.5.1. Sagittal Plane
  - 1.5.2. Transverse Plane
  - 1.5.3. Coronal Plane
  - 1.5.4. Oblique Planes
  - 1.5.5. Ultrasound Marking
  - 1.5.6. Transducer Movements

## Module 2. Ultrasonographic Approach to Major Syndromes

- 2.1. Cardiac Arrest
  - 2.1.1. Cerebral Hemodynamics
  - 2.1.2. Brain Damage in Cardiac Arrest
  - 2.1.3. Usefulness of Ultrasound in Resuscitation
  - 2.1.4. Usefulness of Ultrasound After Recovery of Spontaneous Circulation
- 2.2. Shock
  - 2.2.1. Ventricular Filling Pressure
  - 2.2.2. Heart Failure
  - 2.2.3. Prediction of the Hemodynamic Response to Intravascular Volume Administration
  - 2.2.4. Ultrasound Evaluation of Pulmonary Edema
  - 2.2.5. Ultrasound Search for Sources of Sepsis
- 2.3. Respiratory Failure
  - 2.3.1. Acute Respiratory Failure: Diagnosis
  - 2.3.2. Abrupt Hypoxemia in Patients on Mechanical Ventilation
  - 2.3.3. Monitoring of Recruitment Maneuvers
  - 2.3.4. Evaluation of Extravascular Lung Water
- 2.4. Acute Renal Failure
  - 2.4.1. Hydronephrosis
  - 2.4.2. Lithiasis
  - 2.4.3. Acute Tubular Necrosis
  - 2.4.4. Doppler Ultrasound in Acute Renal Failure
  - 2.4.5. Seminal Vesicle Ultrasound in Acute Renal Failure
- 2.5. Trauma
  - 2.5.1. FAST and e-FAST (Hemo and Pneumothorax)
  - 2.5.2. Ultrasonographic Evaluation in Special Situations
  - 2.5.3. Hemodynamic Evaluation Focused on Trauma
- 2.6. Stroke
  - 2.6.1. Justification
  - 2.6.2. Initial Assessment
  - 2.6.3. Ultrasonographic Assessment
  - 2.6.4. Ultrasound-Guided Management

**Module 3. Ultrasound-Guided Procedures**

- 3.1. Airway
  - 3.1.1. Advantages and Disadvantages
  - 3.1.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
  - 3.1.3. Orotracheal Intubation Technique
  - 3.1.4. Percutaneous Tracheotomy Technique
  - 3.1.5. Common Problems, Complications and Practical Advice
- 3.2. Vascular Cannulation
  - 3.2.1. Indications and Advantages of the Anatomical Reference Technique
  - 3.2.2. Current Evidence on Ultrasound-Guided Vascular Cannulation
  - 3.2.3. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
  - 3.2.4. Ultrasound-Guided Central Venous Cannulation Technique
  - 3.2.5. Single Peripheral Catheter and Peripherally Inserted Central Catheter (PICC) Cannulation
  - 3.2.6. Arterial Cannulation Technique
  - 3.2.7. Implementation of an Ultrasound-Guided Vascular Cannulation Protocol
  - 3.2.8. Common Problems, Complications and Practical Advice
- 3.3. Pericardiocentesis and Thoracentesis
  - 3.3.1. Indications and Advantages of the Anatomical Reference Technique
  - 3.3.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
  - 3.3.3. Ultrasound Specifications and Pericardial Drainage Technique
  - 3.3.4. Ultrasound Specifications and Thoracic Drainage Technique
  - 3.3.5. Common Problems, Complications and Practical Advice
- 3.4. Paracentesis
  - 3.4.1. Indications and Advantages of the Anatomical Reference Technique
  - 3.4.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
  - 3.4.3. Ultrasound Specifications and Technique
  - 3.4.4. Common Problems, Complications and Practical Advice
- 3.5. Lumbar Puncture
  - 3.5.1. Indications and Advantages of the Anatomical Reference Technique
  - 3.5.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
  - 3.5.3. Technique
  - 3.5.4. Common Problems, Complications and Practical Advice
- 3.6. Other Drainage and Probing
  - 3.6.1. Suprapubic Probing
  - 3.6.2. Collection Drainage
  - 3.6.3. Extraction of Foreign Bodies



*A unique training opportunity to advance your career"*

05

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.





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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*



## At TECH Nursing School we use the Case Method

In a given situation, what should a professional do? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Nurses learn better, faster, and more sustainably over time.

*With TECH, nurses can experience a learning methodology that is shaking the foundations of traditional universities around the world.*



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, in an attempt to recreate the real conditions in professional nursing practice.

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*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method”*

The effectiveness of the method is justified by four fundamental achievements:

1. Nurses who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on practical skills that allow the nursing professional to better integrate knowledge acquisition into the hospital setting or primary care.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.



## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine case studies with a 100% online learning system based on repetition combining a minimum of 8 different elements in each lesson, which is a real revolution compared to the simple study and analysis of cases.



*The nurse will learn through real cases and by solving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology we have trained more than 175,000 nurses with unprecedented success in all specialities regardless of practical workload. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

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

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.



This program offers the best educational material, prepared with professionals in mind:



### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is really specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



### Nursing Techniques and Procedures on Video

We introduce you to the latest techniques, to the latest educational advances, to the forefront of current medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch them as many times as you want.



### Interactive Summaries

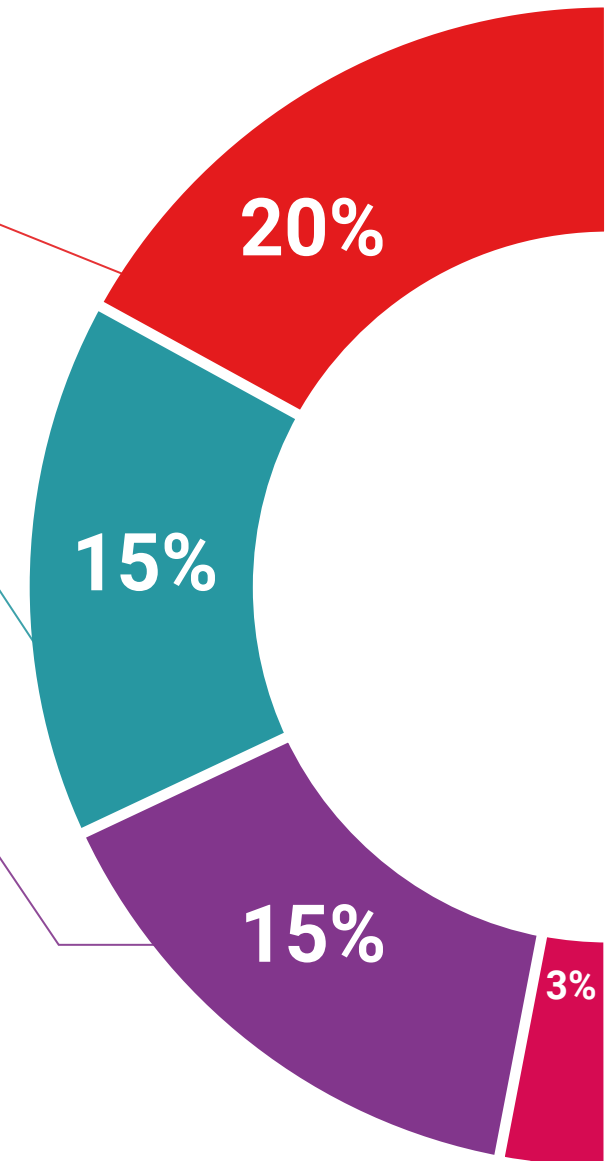
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

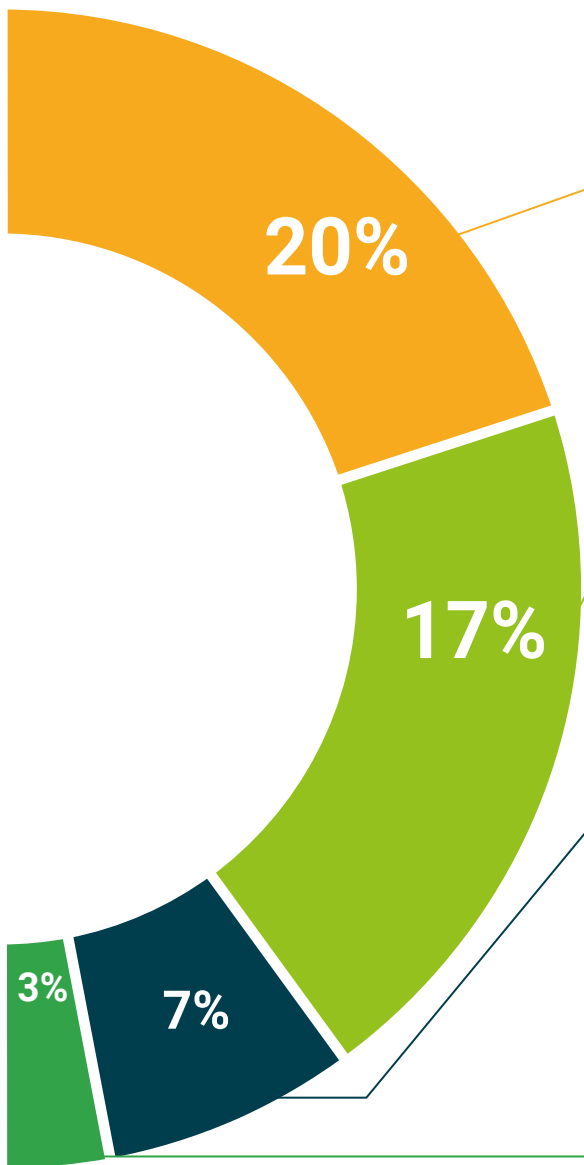
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





#### Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



#### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.



#### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.  
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



#### Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.





# 06 Certificate

The Postgraduate Diploma in Ultrasonographic Approach to Major Syndromes and Ultrasound-Guided Procedures for Nursing guarantees you, in addition to the most rigorous and up-to-date specialization, access to a Postgraduate Diplomae 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 Diploma in Ultrasonographic Approach to Major Syndromes and Ultrasound-Guided Procedures for Nursing** 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 Diploma** issued by **TECH Technological University** via tracked delivery\*.

The diploma 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 Ultrasonographic Approach to Major Syndromes and Ultrasound-Guided Procedures for Nursing**

Official N° of Hours: **450 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.



**Postgraduate Diploma**  
Ultrasonographic Approach  
to Major Syndromes  
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Procedures for Nursing

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



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Ultrasonographic Approach to  
Major Syndromes and Ultrasound-  
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