

# Postgraduate Diploma

## Clinical Abdominal and Musculoskeletal Ultrasound in Emergencies and Intensive Care for Nursing



## Postgraduate Diploma Clinical Abdominal and Musculoskeletal Ultrasound in Emergencies and Intensive Care for Nursing

Course Modality: **Online**

Duration: **6 months**.

Certificate: **TECH Technological University**

Official N° of hours: **450 h**.

Website: [www.techtute.com/nursing/postgraduate-diploma/postgraduate-diploma-clinical-abdominal-musculoskeletal-ultrasound-emergencies-intensive-care-nursing](http://www.techtute.com/nursing/postgraduate-diploma/postgraduate-diploma-clinical-abdominal-musculoskeletal-ultrasound-emergencies-intensive-care-nursing)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Course Management

---

*p. 12*

04

Structure and Content

---

*p. 18*

05

Methodology

---

*p. 22*

06

Certificate

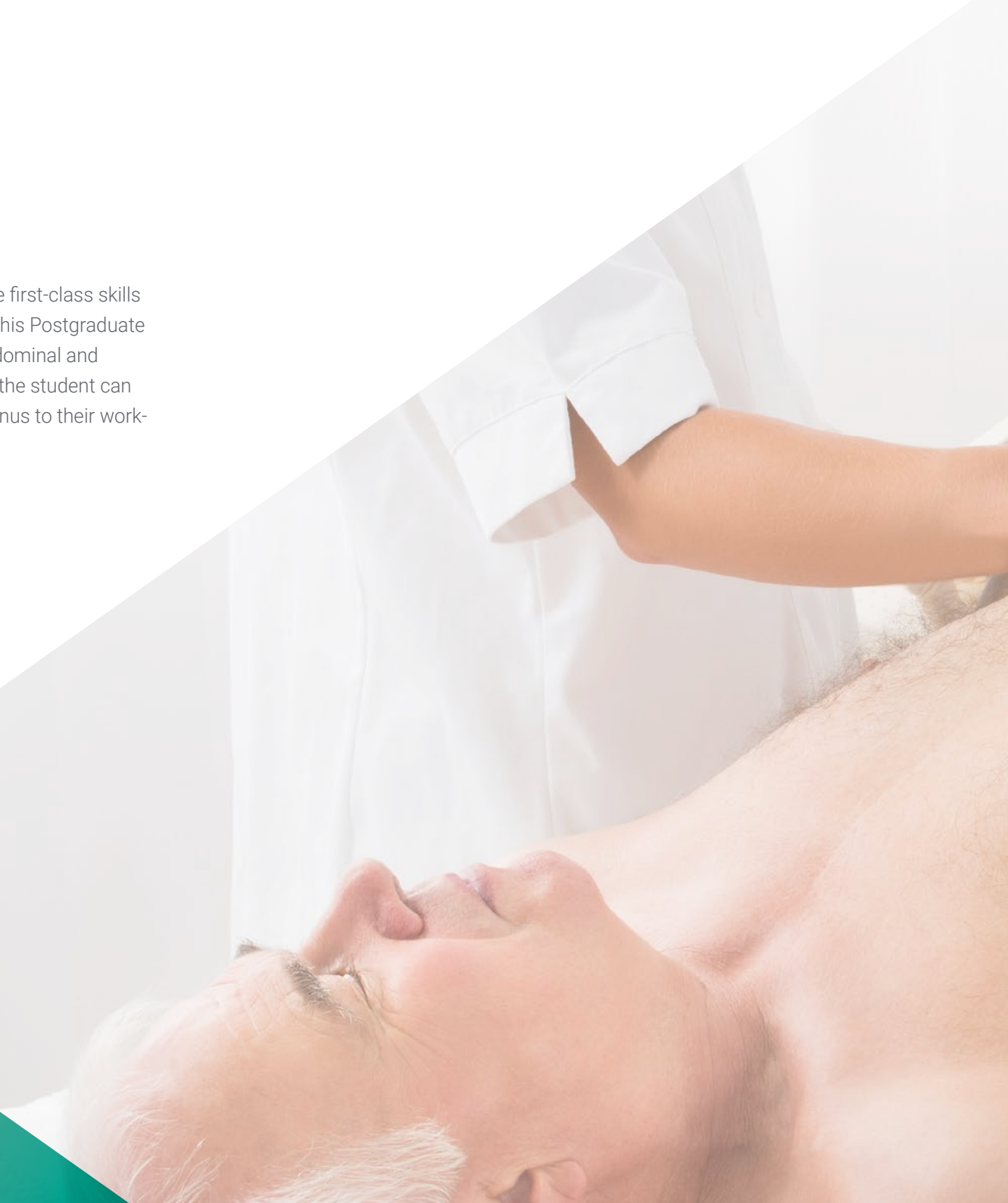
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*p. 30*

# 01

# Introduction

Nurses who work in emergency services and intensive care should have first-class skills in different healthcare techniques and in the use of innovative tools. In this Postgraduate Diploma, TECH presents the most complete information on Clinical Abdominal and Musculoskeletal Ultrasound in Emergencies and Intensive Care so that the student can develop in their profession with total confidence, providing an added bonus to their work-related education.





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*We offer you the most complete education, delivered by the leading professionals in the field, in order to achieve the goal of providing quality practice that every nurse should be aiming for”*

The use of ultrasound has advanced exponentially in recent years, expanding on its traditional use to be used in practically all healthcare departments. Therefore, it is important for nurses to have extensive training in this field, offering them the most advanced knowledge in the subject matter.

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 specialization program on clinical ultrasound, specifying its 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 program, the student will have the opportunity to balance their studies with the rest of their daily commitments, so that they will be able to improve their level of training in a comfortable way.

This **Postgraduate Diploma in Clinical Abdominal and Musculoskeletal Ultrasound in Emergencies and Intensive Care for Nursing** contains the most complete and up-to-date scientific program on the market. The most important features of the program include:

- ♦ 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 developments in Clinical Abdominal and Musculoskeletal Ultrasound in Emergencies and Intensive Care
- ♦ 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 specialization in Clinical Abdominal and Musculoskeletal Ultrasound in Emergencies and Intensive Care for Nursing, and you will obtain a Postgraduate Diploma issued by TECH Technological University”*

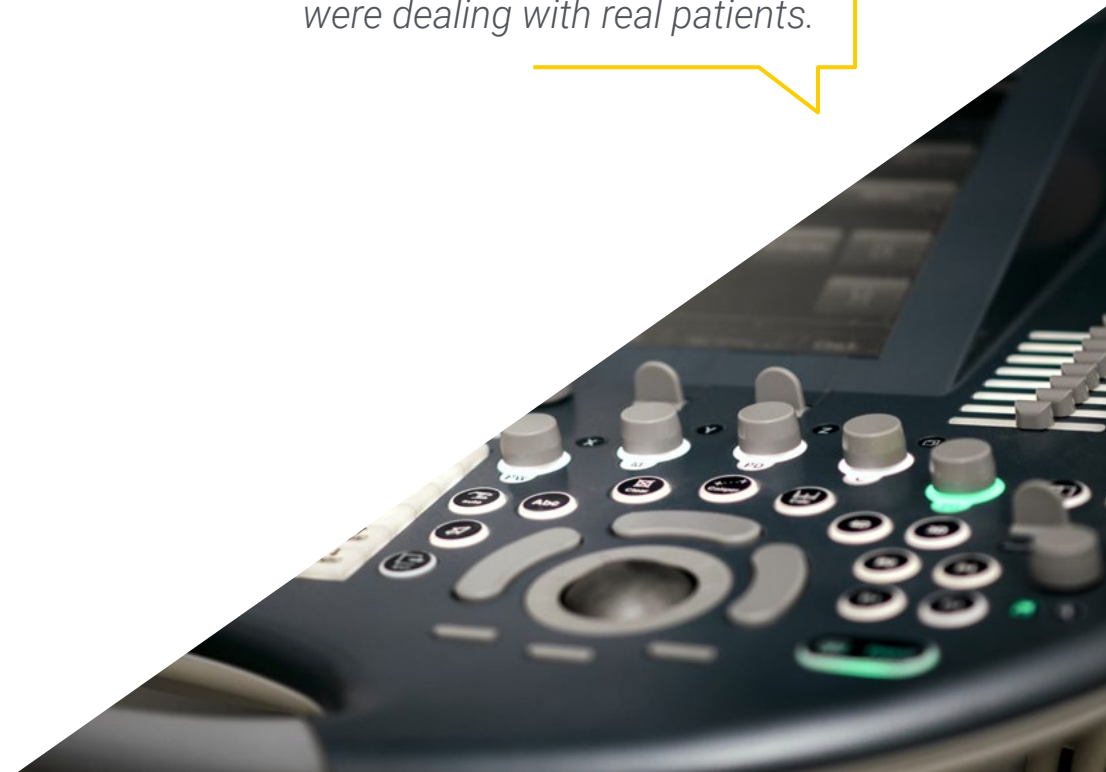
The teaching staff includes professionals from the field of clinical ultrasound, who contribute their experience to this program, as well as renowned specialists from leading scientific societies.

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 purpose, the physician will be assisted by an innovative interactive video system created by renowned and experienced experts in the field of clinical ultrasound in emergencies and intensive care for nursing and who have 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 Clinical Abdominal and Musculoskeletal Ultrasound in Emergencies and Intensive Care for Nursing is aimed at enhancing the physician's ability to diagnose and 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

- Update the nurses' knowledge in the processes of use of ultrasound devices for the management of abdominal and musculoskeletal pathological conditions in the patient, specifically in emergency situations and in critically ill patients, regardless of the environment in which they find themselves



*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 econavigation

### Module 2. Clinical Abdominal Ultrasound

- ◆ Explain the abdominal anatomy
- ◆ Describe the technical requirements of abdominal ultrasounds
- ◆ Explain the examination technique for abdominal ultrasounds
- ◆ Explain the Eco-FAST methodology
- ◆ Define the principles of ultrasounds of the digestive system
- ◆ Define the principles of diaphragmatic ultrasounds

### Module 3. Musculoskeletal Clinical Ultrasound

- ◆ Explain the anatomy of the musculoskeletal system
- ◆ Define the technical requirements of musculoskeletal ultrasound
- ◆ Explain the examination technique for musculoskeletal ultrasounds
- ◆ Define the sonoanatomy of the locomotor system
- ◆ Explain the principles of ultrasounds of the most common acute locomotor system injuries

03

# Course Management

The program includes in its teaching staff renowned experts in Clinical Ultrasound, who contribute their 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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*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

## Coordination

### Dr. Fumadó Queral, Josep

- ♦ Degree in Medicine and Surgery
- ♦ Physician Specialist in Family Medicine
- ♦ Primary Care Team in Amposta, Tarragona
- ♦ Professor of Clinical Ultrasound of the Spanish Society of General Medicine (SEMG)
- ♦ Collaborating Professor and Honorary Member of the Canary Society of Ultrasound (SOCANECO)

### 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
- ♦ Member of the HU-CI Project
- ♦ Creator and Director of Course of Ultrasound-guided Venous Canalization (CAVE)

**Dr. Jiménez Díaz, Fernando**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Sport Medicine
- ◆ Professor in the Faculty of Sports Sciences at the University of Castilla La Mancha
- ◆ Director of the International Chair of Musculoskeletal Ultrasound of the Catholic University of Murcia

**Dr. Herrero Hernández, Raquel**

- ◆ 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. López Cuenca, Sonia**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Intensive Care Medicine
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- ◆ Member of the Ecoclub of SOMIAMA

**Dr. Martínez Crespo, Javier**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Intensive Care Medicine
- ◆ Radio Diagnostic Attending Physician
- ◆ Getafe University Hospital. Getafe, Madrid
- ◆ Associate Professor at the European University of Madrid.
- ◆ Collaborator 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. Pérez Morales, Luis Miguel**

- ◆ Degree in Medicine and Surgery
- ◆ Physician Specialist in Family Medicine
- ◆ Primary Care Doctor
- ◆ Arucas Health Center, Las Palmas de Gran Canaria
- ◆ President of the Canaries Society for Ultrasound (SOCANECO)
- ◆ Member of the European Federation of Societies of Ultrasound in Medicine and Biology (EFSUMB)







**Dr. Villa Vicente, Gerardo**

- ◆ Degree in Medicine and Surgery
- ◆ Medical Specialist in Physical Education and Sports Medicine
- ◆ Professor of Physical Education and Sports at the University of León
- ◆ Expert in Ultrasound MSK (SEMED-FEMEDE)

“ *A unique training opportunity to advance your career*”

# 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. Specialised 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. Clinical Abdominal Ultrasound

- 2.1. Anatomy Recap
  - 2.1.1. Abdominal Cavity
  - 2.1.2. Liver
  - 2.1.3. Gallbladder and Bile Ducts
  - 2.1.4. Retroperitoneum and Great Vessels
  - 2.1.5. Pancreas
  - 2.1.6. Bladder
  - 2.1.7. Kidneys
  - 2.1.8. Bladder
  - 2.1.9. Prostate and Seminal Vesicles
  - 2.1.10. Uterus and Ovaries
- 2.2. Technical Requirements
  - 2.2.1. Ultrasound Equipment
  - 2.2.2. Types of Transducers for Abdominal Examination
  - 2.2.3. Basic Ultrasound Settings
  - 2.2.4. Patient Preparation
- 2.3. Examination Technique
  - 2.3.1. Study Maps
  - 2.3.2. Probe Movements
  - 2.3.3. Visualization of Organs According to Conventional Sectioning
  - 2.3.4. Systematic Study
- 2.4. ECO-FAST Methodology
  - 2.4.1. Equipment and Transducers
  - 2.4.2. ECO-FAST I
  - 2.4.3. ECO-FAST II
  - 2.4.4. ECO-FAST III. Perivesical Effusion
  - 2.4.5. ECO-FAST IV. Pericardial Effusion
  - 2.4.6. ECO-FAST V. Rule out ABD Aortic Aneurysm

- 2.5. Ultrasound Scan of the Digestive System
  - 2.5.1. Liver
  - 2.5.2. Gallbladder and Bile Ducts
  - 2.5.3. Pancreas
  - 2.5.4. Bladder
- 2.6. Genitourinary Ultrasound
  - 2.6.1. Kidney
  - 2.6.2. Urinary Bladder
  - 2.6.3. Male Genital System
  - 2.6.4. Female Genital System

## Module 3. Musculoskeletal Clinical Ultrasound

- 3.1. Anatomy Recap
- 3.2. Technical Requirements
- 3.3. Examination Technique
- 3.4. Sonoanatomy of the Locomotor System: I. Upper Extremities
- 3.5. Sonoanatomy of the Locomotor System: II. Lower Extremities
- 3.6. Ultrasound in the Most Frequent Acute Locomotor System Injuries



*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.



“

*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 Clinical Abdominal and Musculoskeletal Ultrasound in Emergencies and Intensive Care for Nursing guarantees you, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma 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 Clinical Abdominal and Musculoskeletal Ultrasound in Emergencies and Intensive Care 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 Certificate**, issued by **TECH Technological University** via tracked delivery\*.

The Certificate 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 Clinical Abdominal and Musculoskeletal Ultrasound in Emergencies and Intensive Care for Nursing**

Official N° of Hours: **450 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 commin  
personalized service innovation  
knowledge preservation  
online  
development languages  
classroom



**Postgraduate Diploma**  
Clinical Abdominal  
and Musculoskeletal  
Ultrasound in Emergencies  
and Intensive Care for Nursing

Course Modality: Online

Duration: 6 months.

Certificate: TECH Technological University

Official N° of hours: 450 h.

# Postgraduate Diploma

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Musculoskeletal Ultrasound  
in Emergencies and Intensive  
Care for Nursing

