

# Advanced Master's Degree Clinical Ultrasound for Nursing





## Advanced Master's Degree Clinical Ultrasound for Nursing

- » Modality: online
- » Duration: 2 years
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/nursing/advanced-master-degree/advanced-master-degree-clinical-ultrasound-nursing](http://www.techtute.com/us/nursing/advanced-master-degree/advanced-master-degree-clinical-ultrasound-nursing)

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# 01

# Introduction

Clinical ultrasound has an impact on each of the six fundamental domains of the current concept of quality of care: patient safety, effectiveness, efficiency, equity, timeliness and humanization. As a result, its use is effective and has become widespread both in primary care and in patients in emergency or critical care situations.

Nursing professionals should have knowledge of clinical ultrasound in order to improve their professional capacity and provide patients with better healthcare. With this high-level course you will learn the latest developments in the sector from professionals with extensive experience.





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*A high-level specialization  
for professionals seeking to  
achieve career success”*

Ultrasound has been associated with many advances in healthcare in the last 40 years and has become an essential tool in dealing with all kinds of patients. This has evolved in recent decades, from being restricted to radiodiagnostic services, to being included in all healthcare environments.

Clinical ultrasound is the examination of the body through high frequency sound waves that provide an image of the zone to be treated, without exposing the patient to any type of radiation. This is based on sending sound waves that bounce off the body tissues and return to the device and the machine is responsible for generating the images seen by the nursing professional. Using this system enhances the ability to diagnose patients.

Its advantages include portability, accuracy, real-time visualization, reproducibility and efficiency (cost/effectiveness). Likewise, its usefulness has been demonstrated in both in-hospital and out-of-hospital settings.

To use it appropriately, it is not only necessary to have a good technique, but also to have other skills such as speed in the execution of the test and knowing how to accurately interpret the information. An early diagnosis can change the treatment plan and the prognosis in patients with different pathologies. Therefore, it is necessary for nursing professionals to master these techniques which are highly relevant to their daily practice.

A unique opportunity to improve the quality of patient care and address current approaches to the different challenges that arise in their profession.

This **Advanced Master's Degree in Clinical Ultrasound for Nursing** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ◆ The latest technology in online teaching software
- ◆ A highly visual teaching system, supported by graphic and schematic contents that are easy to assimilate and understand
- ◆ Practical cases presented by practising experts
- ◆ State-of-the-art interactive video systems
- ◆ Teaching supported by remote training
- ◆ Continuous updating and retraining systems
- ◆ Autonomous learning that is fully compatible with other occupations
- ◆ Practical exercises for self-evaluation and learning verification
- ◆ Support groups and educational synergies: Questions to the expert, discussion forums and knowledge
- ◆ Communication with the teacher and individual reflection work
- ◆ Content that is accessible from any fixed or portable device with an Internet connection
- ◆ Supplementary documentation databases are permanently available, even after the program



*With this specialist course you will master the most advanced procedures of ultrasound, thereby improving your problem-solving ability"*

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*Acquire academic excellence with this highly scientifically rigorous specialization course"*

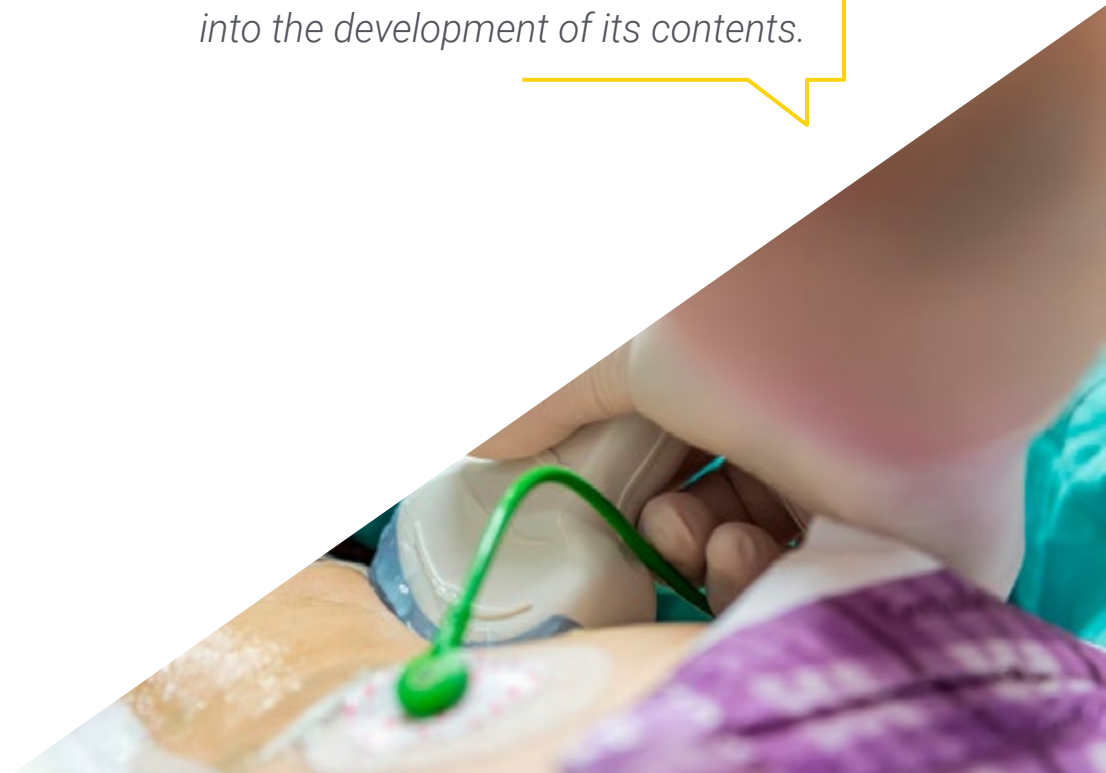
Our teaching staff is made up of working professionals. In this way we ensure that we deliver the educational and up-to-date knowledge we are aiming for. A multidisciplinary staff of trained and experienced professionals from a variety of fields, who will develop theoretical knowledge in an efficient manner, but above all, will contribute the practical knowledge derived from their own experience.

The effectiveness of the methodological design of this Advanced Master's Degree enhances the student's understanding of the content. Developed by a multidisciplinary team of e-learning experts, it integrates the latest advances in educational technology. In this way, you will be able to study with a range of easy-to-use and versatile multimedia tools that will give you the necessary skills you need for your specialization.

The design of this program is based on Problem-Based Learning, an approach that conceives learning as a highly practical process. To achieve this remotely, we will use online learning. With the help of an innovative interactive video system and Learning from an Expert, you will be able to acquire the knowledge as if you were actually dealing with the scenario you are learning about. A concept that will allow you to integrate and consolidate learning in a more realistic and permanent way.

*An in-depth and comprehensive study into strategies and approaches in the application of clinical ultrasound.*

*Renowned professionals have meticulously designed this high-level specialization, investing all their knowledge and experience into the development of its contents.*



# 02 Objectives

Our objective is to train highly qualified professionals for the working world. An objective that is complemented, moreover, in a global manner, by promoting human development that lays the foundations for a better society. This objective is focused on helping professionals reach a much higher level of expertise and control. A goal that you will be able to achieve thanks to a highly intensive and detailed course.







*This Advanced Master's Degree is designed to help you update your knowledge in Clinical Ultrasound, with the use of the latest educational technology, to contribute with quality and confidence to decision-making, diagnosis, treatment, and patient support"*



## General objectives

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- Acquire the necessary knowledge in the use of ultrasound, in order to manage the routine situations of their practical use in healthcare
- Apply the skills acquired while performing the duties of an ultrasound specialist
- Use the latest clinical developments in the day-to-day work of a nursing professional
- Convert nurses into experts in the use of ultrasound for the management of emergency situations and critical patients, regardless of the environment in which they find themselves



*A unique opportunity to specialize  
in a sector with high demand for  
qualified professionals”*





## Specific objectives

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- ◆ Optimize ultrasound imaging through in-depth knowledge of the physical principles of ultrasound and the controls and operation of ultrasound scanners
- ◆ Master the basic and advanced procedures of ultrasound, both at diagnostic and therapeutic level
- ◆ Excel in spatial orientation or "echonavigation"
- ◆ Practice all ultrasound modes in the safest way for the patient
- ◆ Know the indications and limitations of Clinical Ultrasound, and its application in the most common clinical situations
- ◆ Predict the results of invasive diagnostic procedures in a non-invasive way by using ultrasound, with the possibility of replacing them
- ◆ Guide invasive therapeutic procedures to minimize their risks
- ◆ Understand how to extend the concept of Clinical Ultrasound to healthcare, research, and academic environments
- ◆ Explain the cardiac anatomy
- ◆ Describe the technical requirements of cardiac ultrasound
- ◆ Explain localization and visualization in cardiac windows
- ◆ Describe sonoanatomy and sonophysiology in cardiac ultrasound
- ◆ Explain the different structural alterations to identify in cardiac ultrasound
- ◆ Define the principles of hemodynamic ultrasound
- ◆ Explain the thoracic anatomy
- ◆ Describe the technical requirements of thoracic ultrasounds
- ◆ Explain the examination technique of thoracic ultrasounds

- ♦ Explain the principles of ultrasounds of the thoracic wall, the pleura and the mediastinum
- ♦ Define the principles of pulmonary ultrasounds
- ♦ Define the principles of diaphragmatic ultrasounds
- ♦ Explain the vascular anatomy
- ♦ Describe the technical requirements of vascular ultrasounds
- ♦ Explain the examination technique for vascular ultrasounds
- ♦ Explain the principles of ultrasound for the main thoracoabdominal vessels
- ♦ Define the principles of ultrasounds of the supra-aortic trunks
- ♦ Explain the principles of ultrasound of peripheral arterial circulation
- ♦ Describe cerebral hemodynamics
- ♦ Explain the location and visualization of the windows in cerebral ultrasounds
- ♦ Define the different ultrasound modes in cerebral ultrasounds
- ♦ Explain the examination technique for cerebral ultrasounds
- ♦ Explain the different structural alterations to identify in cerebral ultrasounds
- ♦ Explain the different hemodynamic alterations to identify in cerebral ultrasound
- ♦ Describe the process for performing an ocular 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 genitourinary ultrasounds
- ♦ Explain the anatomy of the musculoskeletal system





- ◆ Describe the technical requirements of musculoskeletal ultrasounds
- ◆ 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
- ◆ 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
- ◆ 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
- ◆ Describe the technical requirements of pediatric ultrasounds
- ◆ Explain the examination technique for pediatric ultrasounds
- ◆ Describe pediatric sonoanatomy and sonophysiology
- ◆ Explain the use of ultrasound in the major pediatric syndromes

# 03 Skills

Once all the contents have been studied and the objectives of the Advanced Master's Degree in Clinical Ultrasound for Nursing have been achieved, the health professional will have gained superior expertise and performance in this area. A very complete approach, in a high-level Advanced Master's Degree, which makes the difference.



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*Seize the opportunity and take the step to get up to date on the latest developments in Clinical Ultrasound for Nursing”*



## General skills

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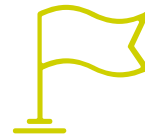
- ♦ Apply the knowledge acquired to resolving the main health problems within the field of Clinical Ultrasound
- ♦ Develop learning to learn as one of the most important skills for any professional nowadays, who is obliged to undergo constant professional training and improvement due to the speed at which scientific knowledge is advancing
- ♦ Improve skills in the use of ultrasound for diagnosis in order to improve patient care
- ♦ Develop skills for self-improvement, in addition to being able to provide others with training and professional improvement activities due to the high level of scientific and professional skills acquired with this program

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*Our goal is very simple: to offer you a quality specialization with the best teaching system currently available, so that you can achieve excellence in your profession"*







## Specific skills

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- ♦ Use ultrasound imaging skillfully in order to integrate common diagnostic processes into primary care
- ♦ Optimize ultrasound imaging through in-depth knowledge of the physical principles of ultrasound and the controls and operation of ultrasound
- ♦ Understand basic and advanced ultrasound procedures, both diagnostic and therapeutic
- ♦ Excel in spatial orientation or "echonavigation"
- ♦ Practice all ultrasound modes in the safest way for the patient
- ♦ Determine the indications and limitations of clinical ultrasound and its application in the most common clinical situations
- ♦ Predict the results of invasive diagnostic procedures in a non-invasive way by using ultrasound, with the possibility of replacing the invasive techniques
- ♦ Guide invasive therapeutic procedures to minimize their risks
- ♦ Understand how to extend the concept of Clinical Ultrasound to healthcare and academic environments

04

# Course Management

The program's teaching staff includes leading experts in Clinical Ultrasound for Nursing, who contribute their vast work experience to this specialization 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 Clinical  
Ultrasound for Nursing from professionals  
who have extensive experience in the field”*

## Management



### Dr. Fumadó Queral, Josep

- ♦ Family physician at Els Muntells Primary Care Center (Amposta, Tarragona)
- ♦ Graduate in Clinical Ultrasound and Training of Trainers from the University of Montpellier-Nîmes (France)
- ♦ Lecturer at the Mediterranean Association of General Medicine
- ♦ Teacher at the Spanish School of Ultrasound of the Spanish Society of General and Family Physicians (SEMG)
- ♦ Honorary Member of the Canary Society of Ultrasound (SOCANECO) and Professor of its Annual Symposium
- ♦ Lecturer in the Master's Degree in Clinical Ultrasound for Emergencies and Critical Care at the CEU Cardenal Herrera University



### Dr. Pérez Morales, Luis Miguel

- ♦ Family physician at the Primary Care Center of Arucas (Gran Canaria, Canary Islands)
- ♦ Diploma in Ultrasound in Primary Care. Rovira i Virgili University. Catalan Institute of Health
- ♦ Expert in Thoracic Ultrasound. University of Barcelona
- ♦ Expert in Abdominal and Musculoskeletal Clinical Ultrasound for Emergency and Critical Care. CEU Cardenal Herrera University
- ♦ President and Professor of the Canary Society of Ultrasound (SOCANECO) and Director of its Annual Symposium
- ♦ Professor on the Master's Degree in Clinical Ultrasound for Emergency and Critical Care at the CEU Cardenal Herrera University



### **Dr. Álvarez Fernández, Jesús Andrés**

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

## **Coordinators**

### **Dr. Flores Herrero, Ángel**

- ♦ Degree in Medicine and Surgery
- ♦ Attending Physician in Vascular Surgery
- ♦ Toledo Hospital Complex
- ♦ Member of the American Society of Surgeons
- ♦ Collaborating Professor at the Catholic University of San Antonio de Murcia (UCAM)

### **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, Córdoba
- ♦ Member of the HU-CI Project
- ♦ Creator and Director of Course of Ecoguided Venous Canalization (CAVE)

**Dr. Osiniri Kippes, María Inés**

- ♦ Degree in Medicine and Surgery
- ♦ Pediatrician
- ♦ Pediatrics, Pediatric Ultrasound and Pediatric Nephrology, Bofill Clinic. Girona
- ♦ Collaborating Professor at the Spanish School of Clinical Ultrasound for Nursing
- ♦ Member of the European Federation of Societies of Ultrasound

**Dr. Vicho Pereira, Raúl**

- ♦ Degree in Medicine and Surgery
- ♦ Specialist in Intensive Care Medicine
- ♦ Quirónsalud Palmaplanas Hospital, Palma de Mallorca
- ♦ President of the Spanish Society for Ultrasound in Critical Cases (ECOCRITIC)

**Dr. Vollmer Torrubiano, Iván**

- ♦ Degree in Medicine and Surgery
- ♦ Medical Specialist in Radiology
- ♦ University Clinic i Provincial Hospital. Barcelona
- ♦ Director in the Specialist Degree in Thoracic Ultrasound at the Autonomous University of Barcelona
- ♦ Collaborator of EcoClub of SOMIAMA and collaborator of SOCANECO

**Scientific Committee**

**Dr. Herrera Carcedo, Carmelo**

- ♦ Family Physician and Head of the Ultrasound Unit at the Briviesca Health Center (Burgos)
- ♦ Tutor at the Family and Community Medicine Teaching Unit in Burgos
- ♦ Teacher at the Spanish School of Ultrasound of the Spanish Society of General and Family Physicians (SEMG)
- ♦ Member of the Spanish Society of Ultrasound (SEECO) and the Spanish Association of Prenatal Diagnosis (AEDP)

**Dr. Jiménez Díaz, Fernando**

- ♦ Specialist in Sports Medicine
- ♦ Professor in the Faculty of Sports Sciences at the University of Castilla La Mancha. Toledo
- ♦ Director of the International Chair of Musculoskeletal Ultrasound of the Catholic University of Murcia
- ♦ Teacher on the Master's Degree in Clinical Imaging in Emergency and Critical Care, CEU Cardenal Herrera University

**Dr. Sánchez Sánchez, José Carlos**

- ♦ Radiodiagnosis Specialist
- ♦ Director of the Integrated Diagnostic Imaging Management Area and Intrahospital Coordinator of the Breast Cancer Early Detection Program, Poniente Hospital, El Ejido, Almería
- ♦ Teacher on the Specialist Degree in Clinical Ultrasound for Family Physicians at the University of Barcelona

## Professors

### Dr. Arancibia Zemelman, Germán

- ♦ Radiology Department Specialist at Meds Clinic. Santiago de Chile (Chile)

### Dr. Argüeso García, Mónica

- ♦ Intensive Care Medicine Department, Gran Canaria Maternity Complex, Las Palmas de Gran Canaria (Canary Islands)

### Dr. Barceló Galíndez, Juan Pablo

- ♦ Specialist in Occupational Medicine and medical sonographer at Mutualia, Bilbao

### Dr. Cabrera González, Antonio José

- ♦ Family Physician. Tamaraceite Health Center. Las Palmas de Gran Canaria (Canary Islands)

### Dr. Corcoll Reixach, Josep

- ♦ Family Physician. Tramuntana Health Center (Mallorca, Balearic Islands)

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- ♦ Angiology and Vascular Surgery Specialist. Dr. Negrín General University Hospital of Gran Canaria. Las Palmas de Gran Canaria (Canary Islands)

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### Dr. Feroso, Antonio Fabián

- ♦ Global Clinical Insights Leader Point of Care. General Electric Healthcare. Madrid

### Dr. Gálvez Gómez, Francisco Javier

- ♦ Ultrasound Portfolio Solutions Manager. SIEMENS Healthcare. Madrid

### Dr. León Ledesma, Raquel

- ♦ Specialist in General and Digestive System Surgery and Obstetrics and Gynecology. Getafe University Hospital. Madrid

### Dr. Martín del Rosario, Francisco Manuel

- ♦ Rehabilitation Specialist. Maternity and Infant Insular University Hospital Complex. Las Palmas de Gran Canaria

### Dr. Moreno Valdés, Javier

- ♦ Business Manager in Ultrasound. Cannon (Toshiba) Medical Systems. Madrid

### Dr. Segura Blázquez, José María

- ♦ Family Physician. Canalejas Health Center. Las Palmas de Gran Canaria (Canary Islands)

### Dr. Santos Sánchez, José Ángel

- ♦ Specialist in the Radiology Department. Salamanca University Hospital. Salamanca

### Dr. Wagüemert Pérez, Aurelio

- ♦ Specialist in Pulmonology. San Juan de Dios Hospital. Santa Cruz de Tenerife (Canary Islands)

### Dr. Abril Palomares, Elena

- ♦ Degree in Medicine and Surgery
- ♦ Specialist in Intensive Care Medicine
- ♦ Attending Physician in the Intensive Care Medicine and Major Burns Unit
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- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Intensive Care Medicine
- ◆ Head of Department in Intensive Medicine and Transplants Coordinator
- ◆ Gregorio Marañón General University Hospital. Madrid
- ◆ Collaborating Professor at the Complutense University of Madrid
- ◆ Trainer in Brain Ultrasound of the National Transplant Organization

**Dr. Hernández Tejedor, Alberto**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Intensive Care Medicine
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- ◆ Alcorcón Foundation University Hospital. Alcorcón, Madrid
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- ◆ Specialist in Intensive Care Medicine
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**Dr. Ortuño Andériz, Francisco**

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**Dr. Phillipps Fuentes, Federico**

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- ◆ Pediatrician
- ◆ Perpetuo Socorro Hospital. Las Palmas de Gran Canaria
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- ◆ Member of the European Federation of Societies of Ultrasound in Medicine and Biology (EFSUMB)

**Dr. Serna Gandía, María**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Anaesthesiology and Resuscitation
- ◆ Denia-Marina Salud Hospital. Denia, Alicante
- ◆ Secretary of the Spanish Society for Ultrasound in Critical Cases (ECOCRITIC)

**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

**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)

**Dr. Yus Teruel, Santiago**

- ◆ Degree in Medicine and Surgery
- ◆ Specialist in Intensive Care Medicine
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- ◆ La Paz- Carlos III University Hospital. Madrid
- ◆ Member of the Ecoclub of SOMIAMA





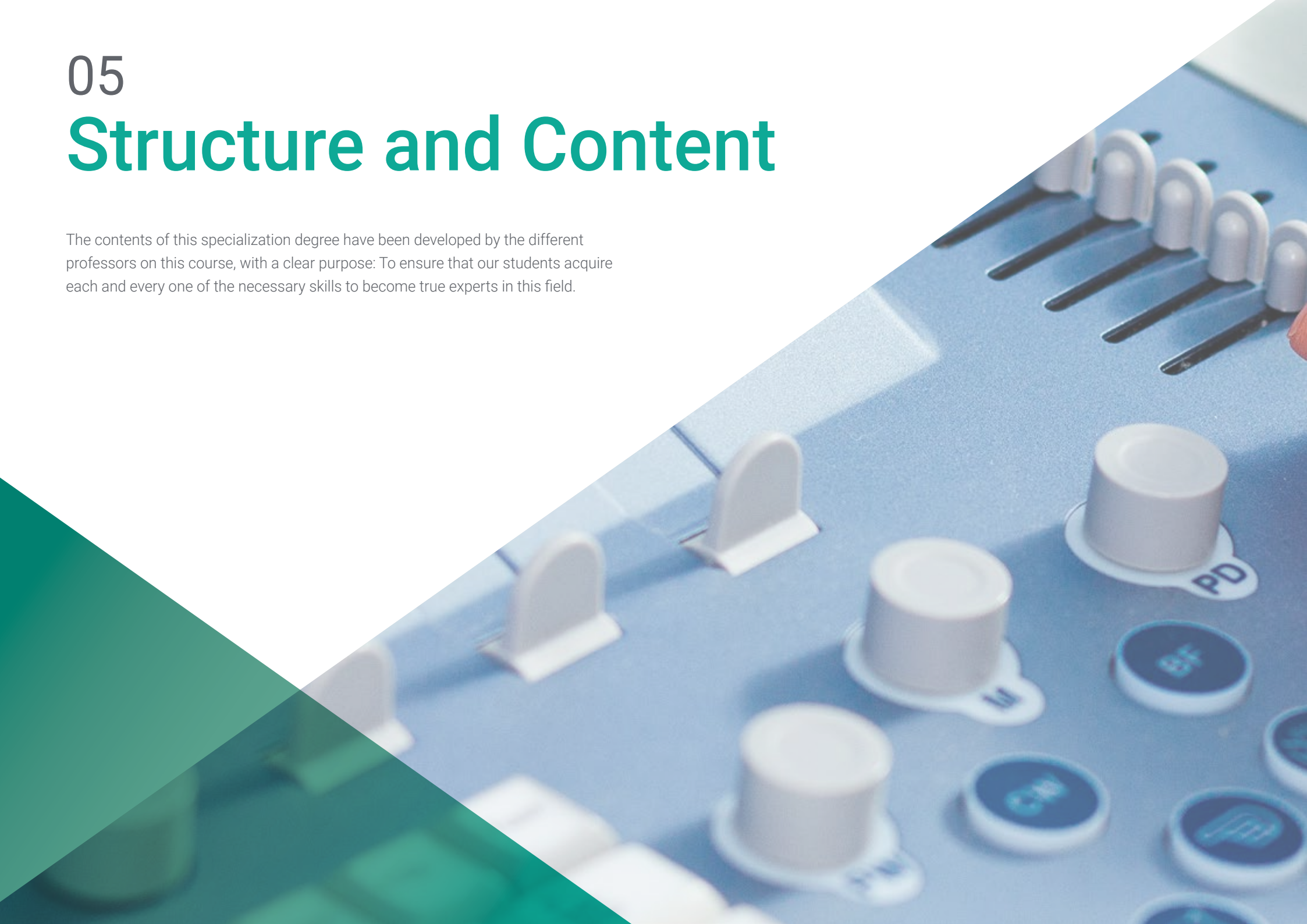
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*A unique specialization program that will allow you to acquire advanced training in this field”*

05

# Structure and Content

The contents of this specialization degree have been developed by the different professors on this course, with a clear purpose: To ensure that our students acquire each and every one of the necessary skills to become true experts in this field.





“

*Through a very well-organized program, you will be able to access the most advanced knowledge in Clinical Ultrasound for Nursing”*

## Module 1. Ultrasound Imaging

- 1.1. Physical Principles
  - 1.1.1. Sounds and Ultrasound
  - 1.1.2. The Nature of Sound
  - 1.1.3. Interaction of Sound with Matter
  - 1.1.4. The 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. Ultrasound Reception
  - 1.2.5. Ultrasound Image Generation
- 1.3. Ultrasound Modes
  - 1.3.1. Modes A and M
  - 1.3.2. Mode B
  - 1.3.3. Doppler Modes (Color, Angio, and Spectral)
  - 1.3.4. Combined Modes
- 1.4. Ultrasound Scanners
  - 1.4.1. Common Components
  - 1.4.2. Classification
  - 1.4.3. Transducers
- 1.5. Ultrasound Maps and Echonavigation
  - 1.5.1. Spatial Layout
  - 1.5.2. Ultrasound Maps
  - 1.5.3. Transducer Movements
  - 1.5.4. Practical Advice
- 1.6. Trends in Ultrasound
  - 1.6.1. 3D/4D Ultrasound
  - 1.6.2. Sonoelastography
  - 1.6.3. Echopotentialization
  - 1.6.4. Other Modes and Techniques

## Module 2. Clinical Ultrasound of the Head and Neck

- 2.1. Anatomy Recap
  - 2.1.1. Cranium and Face
  - 2.1.2. Tubular Structures
  - 2.1.3. Glandular Structures
  - 2.1.4. Vascular Structures
- 2.2. Ocular Ultrasound
  - 2.2.1. Ultrasound Anatomy of the Eye
  - 2.2.2. Ocular Ultrasound Technique
  - 2.2.3. Indications and Contraindications of Ocular Ultrasonography
  - 2.2.4. Ultrasound Report
- 2.3. Ultrasound of Salivary Glands
  - 2.3.1. Regional Sonoanatomy
  - 2.3.2. Technical Aspects
  - 2.3.3. Most Common Tumor and Non-Tumor Pathologies
- 2.4. Thyroid Ultrasound
  - 2.4.1. Ultrasound Technique
  - 2.4.2. Indications
  - 2.4.3. Normal and Pathological Thyroid
  - 2.4.4. Diffuse Goiter
- 2.5. Ultrasound Examination of Adenopathies
  - 2.5.1. Reactive Lymph Nodes
  - 2.5.2. Non-Specific Inflammatory Diseases
  - 2.5.3. Specific Lymphadenitis (Tuberculosis)
  - 2.5.4. Primary Lymph Node Diseases (Sarcoidosis, Hodgkin's Lymphoma, Non-Hodgkin's Lymphoma)
  - 2.5.5. Lymph Node Metastases
- 2.6. Ultrasound of the Supra-Aortic Trunks
  - 2.6.1. Sonoanatomy
  - 2.6.2. Scanning Protocol
  - 2.6.3. Extracranial Carotid Pathology
  - 2.6.4. Vertebral Pathology and Subclavian Artery Steal Syndrome



### Module 3. Clinical Ultrasound of the Digestive Tract and Major Vessels

- 3.1. Hepatic Ultrasound
  - 3.1.1. Anatomy
  - 3.1.2. Liquid Focal Lesions
  - 3.1.3. Solid Focal Lesions
  - 3.1.4. Diffuse Liver Disease
  - 3.1.5. Chronic Liver Disease
- 3.2. Ultrasound of Gallbladder and Bile Ducts
  - 3.2.1. Anatomy
  - 3.2.2. Cholelithiasis and Biliary Sludge
  - 3.2.3. Vesicular Polyps
  - 3.2.4. Cholecystitis
  - 3.2.5. Bile Duct Dilatation
  - 3.2.6. Bile Duct Malformations
- 3.3. Pancreatic Ultrasound
  - 3.3.1. Anatomy
  - 3.3.2. Acute Pancreatitis
  - 3.3.3. Chronic Pancreatitis
- 3.4. Ultrasound of the Major Vessels
  - 3.4.1. Abdominal Aortic Disease
  - 3.4.2. Vena Cava Pathology
  - 3.4.3. Pathology of Celiac Trunk, Hepatic Artery, and Splenic Artery
  - 3.4.4. Aortomesenteric Clamp Pathology
- 3.5. Ultrasound of the Spleen and Retroperitoneum
  - 3.5.1. Spleen Anatomy
  - 3.5.2. Splenic Focal Lesions
  - 3.5.3. Study of Splenomegaly
  - 3.5.4. Adrenal Gland Anatomy
  - 3.5.5. Adrenal Pathology
  - 3.5.6. Retroperitoneal Lesions
- 3.6. The Digestive Tract
  - 3.6.1. Ultrasound Examination of the Stomach
  - 3.6.2. Ultrasound Examination of the Small Intestine
  - 3.6.3. Ultrasound Examination of the Colon

## Module 4. Clinical Genitourinary Ultrasound

- 4.1. Kidneys and Urinary Tract
  - 4.1.1. Anatomy Recap
  - 4.1.2. Structural Alterations
  - 4.1.3. Hydronephrosis. Urinary Tract Dilation
  - 4.1.4. Kidney Stones, Cysts, and Tumors
  - 4.1.5. Renal Insufficiency
- 4.2. Urinary Bladder
  - 4.2.1. Anatomy Recap
  - 4.2.2. Ultrasound Characteristics
  - 4.2.3. Benign Bladder Pathology
  - 4.2.4. Malignant Bladder Pathology
- 4.3. Prostate and Seminal Vesicles
  - 4.3.1. Anatomy Recap
  - 4.3.2. Ultrasound Characteristics
  - 4.3.3. Benign Prostatic Pathology
  - 4.3.4. Malignant Prostatic Pathology
  - 4.3.5. Benign Seminal Pathology
  - 4.3.6. Malignant Seminal Pathology
- 4.4. The Scrotum
  - 4.4.1. Anatomy Recap
  - 4.4.2. Ultrasound Characteristics
  - 4.4.3. Benign Scrotal Pathology
  - 4.4.4. Malignant Scrotal Pathology
- 4.5. The Uterus
  - 4.5.1. Anatomy Recap
  - 4.5.2. Ultrasound Characteristics
  - 4.5.3. Benign Uterine Pathology
  - 4.5.4. Malignant Uterine Pathology
- 4.6. The Ovaries
  - 4.6.1. Anatomy Recap
  - 4.6.2. Ultrasound Characteristics of the Ovaries
  - 4.6.3. Benign Ovarian Pathology
  - 4.6.4. Malignant Ovarian Pathology

## Module 5. Musculoskeletal Clinical Ultrasound

- 5.1. Anatomy Recap
  - 5.1.1. Anatomy of the Shoulder
  - 5.1.2. Anatomy of the Elbow
  - 5.1.3. Anatomy of the Wrist and Hand
  - 5.1.4. Anatomy of the Hip and Thigh
  - 5.1.5. Anatomy of the Knee
  - 5.1.6. Anatomy of the Ankle, Foot, and Leg
- 5.2. Technical Requirements
  - 5.2.1. Introduction
  - 5.2.2. Musculoskeletal Ultrasound Equipment
  - 5.2.3. Ultrasound Imaging Methods
  - 5.2.4. Validation, Reliability, and Standardization
  - 5.2.5. Ultrasound-Guided Procedures
- 5.3. Examination Technique
  - 5.3.1. Basic Concepts in Ultrasound
  - 5.3.2. Rules for Correct Examination
  - 5.3.3. Examination Technique in Ultrasound Study of the Shoulder
  - 5.3.4. Examination Technique in Ultrasound Study of the Elbow
  - 5.3.5. Examination Technique in Ultrasound Study of the Wrist and Hand
  - 5.3.6. Examination Technique in Ultrasound Study of the Hip
  - 5.3.7. Examination Technique in Ultrasound Study of the Thigh
  - 5.3.8. Examination Technique in Ultrasound Study of the Knee
  - 5.3.9. Examination Technique in Ultrasound Study of the Leg and Ankle
- 5.4. Sonoanatomy of the Musculoskeletal System: I. Upper Extremities
  - 5.4.1. Introduction
  - 5.4.2. Shoulder Ultrasound Anatomy
  - 5.4.3. Elbow Ultrasound Anatomy
  - 5.4.4. Wrist and Hand Ultrasound Anatomy



- 5.5. Sonoanatomy of the Musculoskeletal System: II. Lower Extremities
  - 5.5.1. Introduction
  - 5.5.2. Hip Ultrasound Anatomy
  - 5.5.3. Thigh Ultrasound Anatomy
  - 5.5.4. Knee Ultrasound Anatomy
  - 5.5.5. Leg and Ankle
  - 5.5.6. Ultrasound Anatomy
- 5.6. Ultrasound in the Most Frequent Acute Injuries of the Musculoskeletal System
  - 5.6.1. Introduction
  - 5.6.2. Muscle Injuries
  - 5.6.3. Tendon Injuries
  - 5.6.4. Ligament Injuries
  - 5.6.5. Subcutaneous Tissue Injuries
  - 5.6.6. Bone Injuries and Joint Injuries
  - 5.6.7. Peripheral Nerve Injuries

## Module 6. Clinical Vascular Ultrasound for Nursing in Primary Care

- 6.1. Vascular Ultrasound
  - 6.1.1. Description and Applications
  - 6.1.2. Technical Requirements
  - 6.1.3. Procedure
  - 6.1.4. Interpretation of Results. Risks and Benefits
  - 6.1.5. Limitations
- 6.2. Doppler
  - 6.2.1. Fundamentals
  - 6.2.2. Applications
  - 6.2.3. Types of Echo-Doppler
  - 6.2.4. Color Doppler
  - 6.2.5. Power Doppler
  - 6.2.6. Dynamic Doppler
- 6.3. Normal Ultrasound of the Venous System
  - 6.3.1. Anatomy Recap: Venous System of the Upper Extremities
  - 6.3.2. Anatomy Recap: Venous System of the Lower Extremities
  - 6.3.3. Normal Physiology

- 6.3.4. Regions of Interest
- 6.3.5. Functional Tests
- 6.3.6. Report. Vocabulary
- 6.4. Upper Extremity Chronic Venous Disease
  - 6.4.1. Definition
  - 6.4.2. CEAP Classification
  - 6.4.3. Morphological Criteria
  - 6.4.4. Examination Technique
  - 6.4.5. Diagnostic Manoeuvres
  - 6.4.6. Type of Report
- 6.5. Acute/Subacute Vascular Thrombosis of the Upper Extremities
  - 6.5.1. Anatomy Recap
  - 6.5.2. Manifestations of Vascular Thrombosis of the Upper Extremities
  - 6.5.3. Ultrasound Characteristics
  - 6.5.4. Examination Technique
  - 6.5.5. Diagnostic Manoeuvres
  - 6.5.6. Technical Limitations
- 6.6. Acute/Subacute Vascular Thrombosis of the Lower Extremities
  - 6.6.1. Description
  - 6.6.2. Manifestations of Vascular Thrombosis of the Lower Extremities
  - 6.6.3. Ultrasound Characteristics
  - 6.6.4. Examination Technique
  - 6.6.5. Differential Diagnosis
  - 6.6.6. Vascular Report

## Module 7. Clinical Ultrasound in Emergencies

- 7.1. Ultrasound in Respiratory Failure
  - 7.1.1. Spontaneous Pneumothorax
  - 7.1.2. Bronchospasm
  - 7.1.3. Pneumonia
  - 7.1.4. Pleural Effusion
  - 7.1.5. Heart Failure

- 7.2. Ultrasound in Shock and Cardiac Arrest
  - 7.2.1. Hypovolemic Shock
  - 7.2.2. Obstructive Shock
  - 7.2.3. Cardiogenic Shock
  - 7.2.4. Distributive Shock
  - 7.2.5. Cardiac Arrest
- 7.3. Ultrasound in Polytrauma: Eco-FAST
  - 7.3.1. Pericardial Effusion
  - 7.3.2. Hemothorax and Pneumothorax
  - 7.3.3. Hepatorenal or Perihepatic Effusion
  - 7.3.4. Splenorenal or Perisplenic Effusion
  - 7.3.5. Perivesical Effusion
  - 7.3.6. Post-Traumatic Aortic Dissection
  - 7.3.7. Musculoskeletal Injuries
- 7.4. Genitourinary Emergencies
  - 7.4.1. Obstructive Uropathy
  - 7.4.2. Uterine Emergencies
  - 7.4.3. Ovarian Emergencies
  - 7.4.4. Bladder Emergencies
  - 7.4.5. Prostatic Emergencies - Scrotal Emergencies
- 7.5. Acute Abdomen
  - 7.5.1. Cholecystitis
  - 7.5.2. Pancreatitis
  - 7.5.3. Mesenteric Ischemia
  - 7.5.4. Appendicitis
  - 7.5.5. Perforation of the Hollow Viscus
- 7.6. Ultrasound in Sepsis
  - 7.6.1. Hemodynamic Diagnosis
  - 7.6.2. Source Detection
  - 7.6.3. Handling of Liquids

## Module 8. Ultrasound-Guided Procedures in Primary Care

- 8.1. Ultrasound-Guided FNA
  - 8.1.1. Indications/Contraindications. Material
  - 8.1.2. Informed Consent
  - 8.1.3. Procedure
  - 8.1.4. Results
  - 8.1.5. Complications
  - 8.1.6. Quality Control
- 8.2. Ultrasound-Guided Percutaneous Biopsy
  - 8.2.1. Informed Consent
  - 8.2.2. Biopsy Materials (Types of Biopsy Needles)
  - 8.2.3. Procedure
  - 8.2.4. Complications
  - 8.2.5. Care
  - 8.2.6. Quality Control
- 8.3. Drainage of Abscesses and Fluid Collections
  - 8.3.1. Indications and Contraindications
  - 8.3.2. Informed Consent
  - 8.3.3. Requirements and Materials
  - 8.3.4. Technique and Approach Route: Direct Puncture (Trocar) vs. *Step by Step* (Seldinger)
  - 8.3.5. Catheter Management and Patient Care
  - 8.3.6. Side Effects and Complications
  - 8.3.7. Quality Control
- 8.4. Ultrasound-Guided Thoracentesis, Pericardiocentesis, and Paracentesis
  - 8.4.1. Indications and Advantages over the Anatomical Reference Technique
  - 8.4.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
  - 8.4.3. Ultrasound Specifications and Pericardial Drainage Technique
  - 8.4.4. Ultrasound Specifications and Thoracic Drainage Technique
  - 8.4.5. Ultrasound Specifications and Abdominal Drainage Technique
  - 8.4.6. Common Problems, Complications, and Practical Advice

- 8.5. Ultrasound-Guided Vascular Cannulation
  - 8.5.1. Indications and Advantages over the Anatomical Reference Technique
  - 8.5.2. Current Evidence on Ultrasound-Guided Vascular Cannulation
  - 8.5.3. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
  - 8.5.4. Ultrasound-Guided Central Venous Cannulation Technique
  - 8.5.5. Single Peripheral Catheter and Peripherally Inserted Central Catheter (PICC) Cannulation Technique
  - 8.5.6. Arterial Cannulation Technique
- 8.6. Ultrasound-Guided Infiltration and Chronic Pain Treatment
  - 8.6.1. Infiltrations and Pain
  - 8.6.2. Large Joints: Intra-Articular and Myotendinous
  - 8.6.3. Small Joints: Intra-Articular and Myotendinous
  - 8.6.4. Spinal Column

## Module 9. Other Uses of Clinical Ultrasound

- 9.1. Radial Breast Ultrasound
  - 9.1.1. Anatomy Recap
  - 9.1.2. Technical Requirements
  - 9.1.3. Ultrasound Slices
  - 9.1.4. Ultrasound Characteristics. Breast Pathology
  - 9.1.5. Breast Elastography
- 9.2. Dermatological Ultrasound
  - 9.2.1. Echoanatomy of the Skin and Appendages
  - 9.2.2. Ultrasound of Skin Tumors
  - 9.2.3. Ultrasound of Inflammatory Skin Diseases
  - 9.2.4. Ultrasound in Dermoesthetics and its Complications
- 9.3. Introduction to Cerebral Clinical Ultrasound
  - 9.3.1. Brain Anatomy and Physiology of Ultrasound Interest
  - 9.3.2. Ultrasound Techniques and Procedures
  - 9.3.3. Structural Alterations
  - 9.3.4. Functional Alterations
  - 9.3.5. Ultrasound in Intracranial Hypertension

- 9.4. Ultrasound in Diabetes
  - 9.4.1. Aortic/Carotid Atheromatosis in Diabetics
  - 9.4.2. Parenchymal Echogenicity in Diabetic Patients
  - 9.4.3. Biliary Lithiasis in Diabetic Patients
  - 9.4.4. Neurogenic Bladder in Diabetic Patients
  - 9.4.5. Cardiomyopathy in Diabetic Patients
- 9.5. Ultrasound in the Study of Frailty in the Elderly
  - 9.5.1. Frail Elderly
  - 9.5.2. ABCDE Ultrasound in Frail Elderly Patients
  - 9.5.3. Ultrasound Examination of Sarcopenia
  - 9.5.4. Ultrasound Examination of Cognitive Deterioration
- 9.6. Ultrasound Report
  - 9.6.1. Ultrasound Note
  - 9.6.2. Ultrasound Derivation
  - 9.6.3. Ultrasound Report in PC

## Module 10. Clinical Ultrasound for Cardiac Nursing

- 10.1. Cardiac Anatomy
  - 10.1.1. Basic Three-Dimensional Anatomy
  - 10.1.2. Basic Cardiac Physiology
- 10.2. Technical Requirements to Perform a Cardiac Ultrasound
  - 10.2.1. Probes
  - 10.2.2. Characteristics of the Equipment Used in a Cardiac Ultrasound
- 10.3. Cardiac Windows and Examination Techniques
  - 10.3.1. Windows and Maps Applied in Emergencies and Critical Care Situations
  - 10.3.2. Basic Doppler (Color, Pulsating, Continuous and Tissue Doppler)
- 10.4. Structural Alterations
  - 10.4.1. Basic Measures in Cardiac Ultrasound
  - 10.4.2. Thrombi
  - 10.4.3. Suspected Endocarditis
  - 10.4.4. Valvulopathies
  - 10.4.5. Pericardium
  - 10.4.6. How is an ultrasound reported in emergency and intensive care?

- 10.5. Hemodynamic Ultrasound
  - 10.5.1. Left Ventricular Hemodynamics
  - 10.5.2. Right Ventricular Hemodynamics
  - 10.5.3. Preload Dynamic Tests
- 10.6. Transesophageal Echocardiogram
  - 10.6.1. Technique
  - 10.6.2. Indications in Emergencies and Critical Care Cases
  - 10.6.3. Ultrasound-Guided Study of Cardioembolism

### Module 11. Clinical Ultrasound for Thoracic Nursing

- 11.1. Fundamentals of Thoracic Ultrasound and Anatomical Review
- 11.2. Technical Requirements. Examination Technique
- 11.3. Ultrasound of the Thoracic Wall and the Mediastinum
- 11.4. Ultrasound of the Pleura
- 11.5. Pulmonary Ultrasound Scan
- 11.6. Diaphragmatic Ultrasound

### Module 12. Vascular Clinical Ultrasound for Nursing in Emergencies and Critical Care

- 12.1. Anatomy Recap
  - 12.1.1. Venous Vascular Anatomy of the Upper Limbs
  - 12.1.2. Arterial Vascular Anatomy of the Upper Limbs
  - 12.1.3. Venous Vascular Anatomy of the Lower Limbs
  - 12.1.4. Arterial Vascular Anatomy of the Lower Limbs
- 12.2. Technical Requirements
  - 12.2.1. Ultrasound Scanners and Probes
  - 12.2.2. Curve Analysis
  - 12.2.3. Image-Color Media
  - 12.2.4. Echo Contrasts
- 12.3. Examination Technique
  - 12.3.1. Positioning
  - 12.3.2. Insonation. Study Technique
  - 12.3.3. Study of Normal Curves and Speeds

- 12.4. Large Thoracoabdominal Vessels
  - 12.4.1. Venous Vascular Anatomy of the Abdomen
  - 12.4.2. Arterial Vascular Anatomy of the Abdomen
  - 12.4.3. Abdomino-Pelvic Venous Pathology
  - 12.4.4. Abdomino-Pelvic Arterial Pathology
- 12.5. Supra-Aortic Trunks
  - 12.5.1. Venous Vascular Anatomy of the Supra-Aortic Trunks
  - 12.5.2. Arterial Vascular Anatomy of the Supra-Aortic Trunks
  - 12.5.3. Venous Pathology of the Supra-Aortic Trunks
  - 12.5.4. Arterial Pathology of the Supra-Aortic Trunks
- 12.6. Peripheral Arterial and Venous Circulation
  - 12.6.1. Venous Pathology of Lower and Upper Limbs
  - 12.6.2. Arterial Pathology of Lower and Upper Limbs

### Module 13. Clinical Ultrasound for Brain Nursing

- 13.1. Cerebral Hemodynamics
  - 13.1.1. Carotid Circulation
  - 13.1.2. Vertebro-Basilar Circulation
  - 13.1.3. Cerebral Microcirculation
- 13.2. Ultrasound Modes
  - 13.2.1. Transcranial Doppler
  - 13.2.2. Cerebral Ultrasound
  - 13.2.3. Special Tests (Vascular Reaction, HITS, etc)
- 13.3. Ultrasound Windows and Examination Technique
  - 13.3.1. Ultrasound Windows
  - 13.3.2. Operator Position
  - 13.3.3. Study Sequence
- 13.4. Structural Alterations
  - 13.4.1. Collections and Masses
  - 13.4.2. Vascular Anomalies
  - 13.4.3. Hydrocephalus
  - 13.4.4. Venous Pathology

- 13.5. Hemodynamic Alterations
  - 13.5.1. Spectral Analysis
  - 13.5.2. Hyperdynamics
  - 13.5.3. Hypodynamics
  - 13.5.4. Asystole of the Brain
- 13.6. Ocular Ultrasonography
  - 13.6.1. Pupil Size and Reactivity
  - 13.6.2. Diameter of the Optic Nerve Sheath

## Module 14. Clinical Ultrasound for Cerebral Nursing

- 14.1. Anatomy Recap
  - 14.1.1. Abdominal Cavity
  - 14.1.2. Liver
  - 14.1.3. Gallbladder and Bile Ducts
  - 14.1.4. Retroperitoneum and Great Vessels
  - 14.1.5. Pancreas
  - 14.1.6. Spleen
  - 14.1.7. Kidneys
  - 14.1.8. Bladder
  - 14.1.9. Prostate and Seminal Vesicles
  - 14.1.10. Uterus and Ovaries
- 14.2. Technical Requirements
  - 14.2.1. Ultrasound Equipment
  - 14.2.2. Types of Transducers for Abdominal Examination
  - 14.2.3. Basic Ultrasound Settings
  - 14.2.4. Patient Preparation
- 14.3. Examination Technique
  - 14.3.1. Study Maps
  - 14.3.2. Probe Movements
  - 14.3.3. Visualization of Organs According to Conventional Sectioning
  - 14.3.4. Systematic Study

- 14.4. ECO-FAST Methodology
  - 14.4.1. Equipment and Transducers
  - 14.4.2. ECO-FAST I
  - 14.4.3. ECO-FAST II
  - 14.4.4. ECO-FAST III. Perivesical Effusion
  - 14.4.5. ECO-FAST IV. Pericardial Effusion
  - 14.4.6. ECO-FAST V. Rule Out ABD Aortic Aneurysm
- 14.5. Ultrasound Scan of the Digestive System
  - 14.5.1. Liver
  - 14.5.2. Gallbladder and Bile Ducts
  - 14.5.3. Pancreas
  - 14.5.4. Spleen
- 14.6. Genitourinary Ultrasound
  - 14.6.1. Kidney
  - 14.6.2. Urinary Bladder
  - 14.6.3. Male Genital System
  - 14.6.4. Female Genital System

## Module 15. Ultrasonographic Approach to the Major Syndromes

- 15.1. Cardiac Arrest
  - 15.1.1. Cerebral Hemodynamics
  - 15.1.2. Brain Damage in Cardiac Arrest
  - 15.1.3. Usefulness of Ultrasound in Resuscitation
  - 15.1.4. Usefulness of Ultrasound After Recovery of Spontaneous Circulation
- 15.2. Shock
  - 15.2.1. Ventricular Filling Pressure
  - 15.2.2. Heart Failure
  - 15.2.3. Prediction of the Hemodynamic Response to Intravascular Volume Administration
  - 15.2.4. Ultrasound Evaluation of Pulmonary Edema
  - 15.2.5. Ultrasound Search for Sources of Sepsis

- 15.3. Respiratory Failure
    - 15.3.1. Acute Respiratory Failure: Diagnosis
    - 15.3.2. Abrupt Hypoxemia in Patients on Mechanical Ventilation
    - 15.3.3. Monitoring of Recruitment Maneuvers
    - 15.3.4. Evaluation of Extravascular Lung Water
  - 15.4. Acute Renal Failure
    - 15.4.1. Hydronephrosis
    - 15.4.2. Lithiasis
    - 15.4.3. Acute Tubular Necrosis
    - 15.4.4. Doppler Ultrasound in Acute Renal Failure
    - 15.4.5. Seminal Vesicle Ultrasound in Acute Renal Failure
  - 15.5. Trauma
    - 15.5.1. FAST and e-FAST (Hemo and Pneumothorax)
    - 15.5.2. Ultrasound Evaluation in Special Situations
    - 15.5.3. Hemodynamic Evaluation Focused on Trauma
  - 15.6. Stroke
    - 15.6.1. Justification
    - 15.6.2. Initial Assessment
    - 15.6.3. Ultrasound Assessment
    - 15.6.4. Ultrasound-Guided Management
- Module 16. Echo-Guided Procedures in Emergencies and Critical Care**
- 16.1. Airway
    - 16.1.1. Advantages and Disadvantages
    - 16.1.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
    - 16.1.3. Orotracheal Intubation Technique
    - 16.1.4. Percutaneous Tracheotomy Technique
    - 16.1.5. Common Problems, Complications, and Practical Advice
  - 16.2. Vascular Cannulation
    - 16.2.1. Indications and Advantages of the Anatomical Reference Technique
    - 16.2.2. Current Evidence on Ultrasound-Guided Vascular Cannulation
    - 16.2.3. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
    - 16.2.4. Ultrasound-Guided Central Venous Cannulation Technique
    - 16.2.5. Single Peripheral Catheter and Peripherally Inserted Central Catheter (PICC) Cannulation
    - 16.2.6. Arterial Cannulation Technique
    - 16.2.7. Implementation of an Ultrasound-Guided Vascular Cannulation Protocol
    - 16.2.8. Common Problems, Complications, and Practical Advice
  - 16.3. Pericardiocentesis and Thoracentesis
    - 16.3.1. Indications and Advantages of the Anatomical Reference Technique
    - 16.3.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
    - 16.3.3. Ultrasound Specifications and Pericardial Drainage Technique
    - 16.3.4. Ultrasound Specifications and Thoracic Drainage Technique
    - 16.3.5. Common Problems, Complications, and Practical Advice
  - 16.4. Paracentesis
    - 16.4.1. Indications and Advantages of the Anatomical Reference Technique
    - 16.4.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
    - 16.4.3. Ultrasound Specifications and Technique
    - 16.4.4. Common Problems, Complications, and Practical Advice
  - 16.5. Lumbar Puncture
    - 16.5.1. Indications and Advantages of the Anatomical Reference Technique
    - 16.5.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy
    - 16.5.3. Technique
    - 16.5.4. Common Problems, Complications, and Practical Advice
  - 16.6. Other Drainage and Probing
    - 16.6.1. Suprapubic Probing
    - 16.6.2. Collection Drainage
    - 16.6.3. Extraction of Foreign Bodies

## Module 17. Clinical Ultrasound for Cerebral Nursing

- 17.1. Technical Requirements
  - 17.1.1. Ultrasound at the Patient's Bedside
  - 17.1.2. Physical Space
  - 17.1.3. Basic Equipment
  - 17.1.4. Equipment for Interventionalist Ultrasounds
  - 17.1.5. Ultrasound Scanners and Probes
- 17.2. Examination Technique
  - 17.2.1. Pediatric Patient Preparation
  - 17.2.2. Tests and Probes
  - 17.2.3. Ultrasound Section Maps
  - 17.2.4. Examination System
  - 17.2.5. Ultrasound-Guided Procedures
  - 17.2.6. Images and Documentation
  - 17.2.7. Test Report
- 17.3. Pediatric Sonoanatomy and Sonophysiology
  - 17.3.1. Normal Anatomy
  - 17.3.2. Sonoanatomy
  - 17.3.3. Sonophysiology of a Child in the Different Stages of Development
  - 17.3.4. Variants of Normality
  - 17.3.5. Dynamic Ultrasound
- 17.4. Ultrasound of the Major Pediatric Syndromes
  - 17.4.1. Emergency Thorax Ultrasound
  - 17.4.2. Acute Abdomen
  - 17.4.3. Acute Scrotum
- 17.5. Ultrasound-Guided Procedures in Pediatrics
  - 17.5.1. Vascular Access
  - 17.5.2. Extraction of Superficial Foreign Bodies
  - 17.5.3. Pleural Effusion
- 17.6. Introduction to Neonatal Clinical Ultrasound
  - 17.6.1. Emergency Transfontanelar Ultrasound
  - 17.6.2. Most Common Examination Indications in Emergencies
  - 17.6.3. Most Common Pathologies in Emergencies



*A comprehensive specialized program that will take you through the necessary training to compete with the best in your profession”*

# 06

# 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.







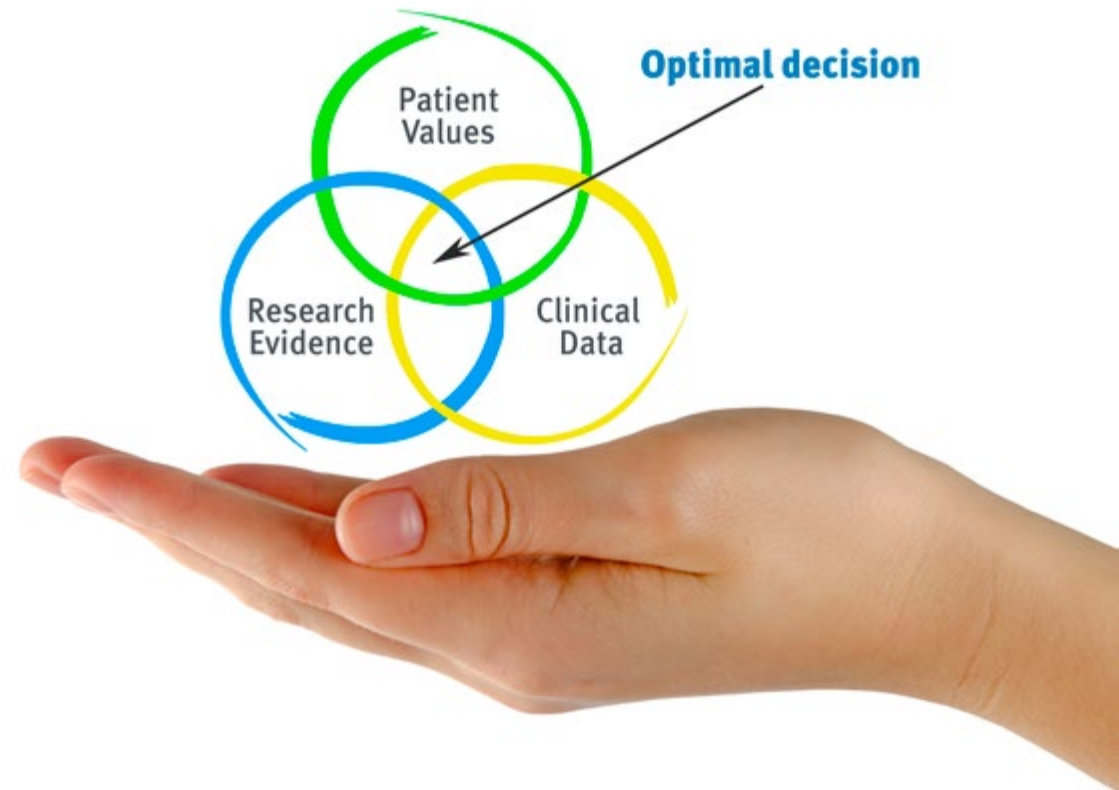
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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## 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

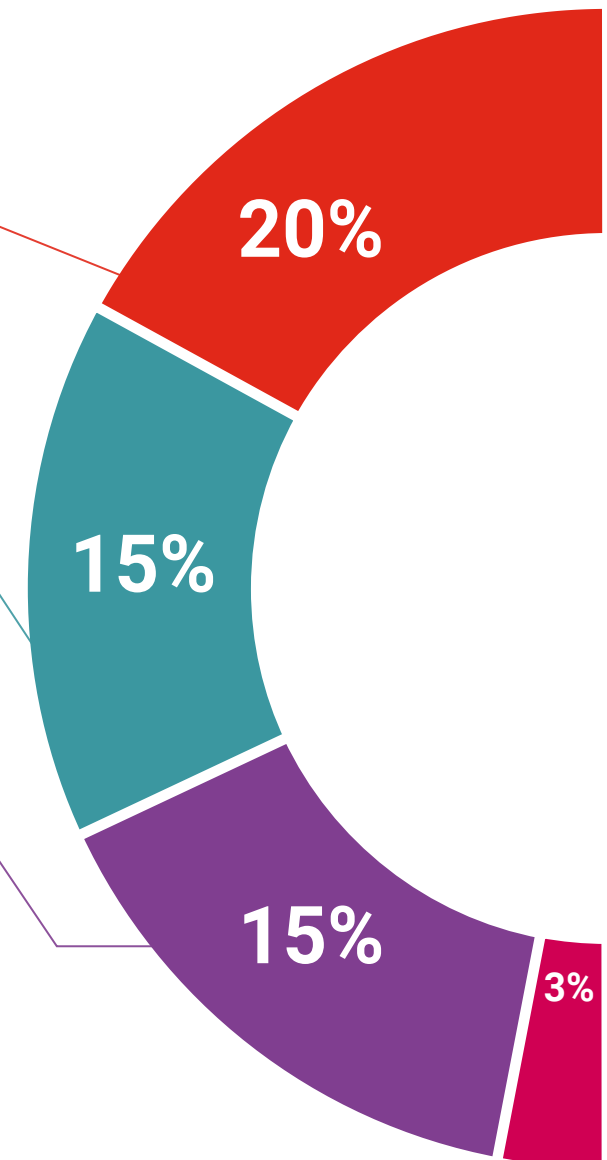
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

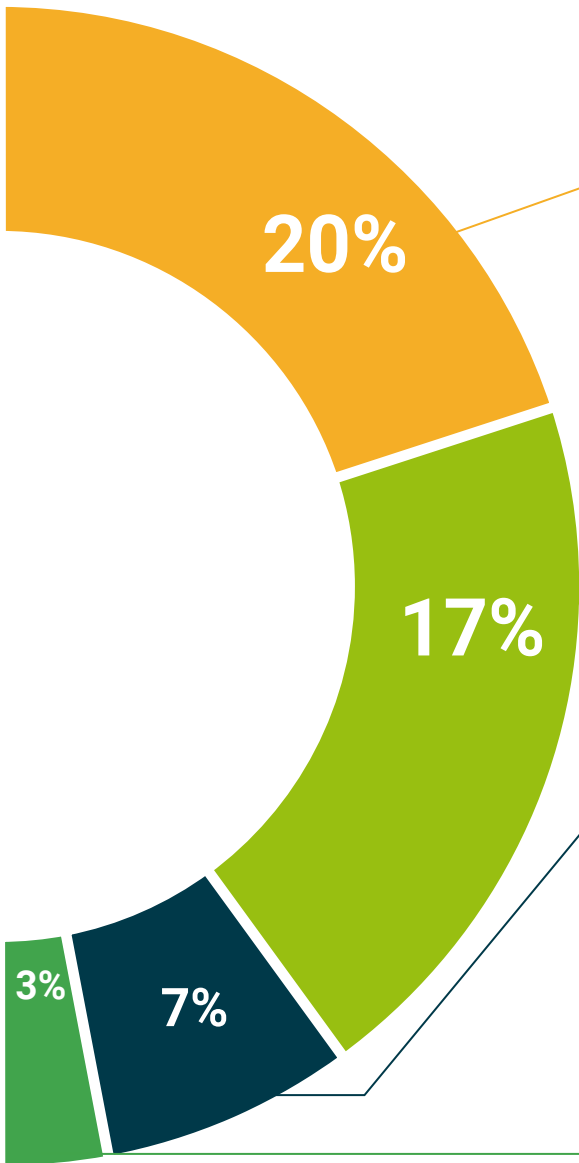
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



### 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.



# 07 Certificate

The Advanced Master's Degree in Clinical Ultrasound for Nursing guarantees you, in addition to the most rigorous and up-to-date training, access to a Advanced Master's Degree issued by TECH Technological University.





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*Successfully complete this program and receive your university diploma without travel or laborious paperwork”*

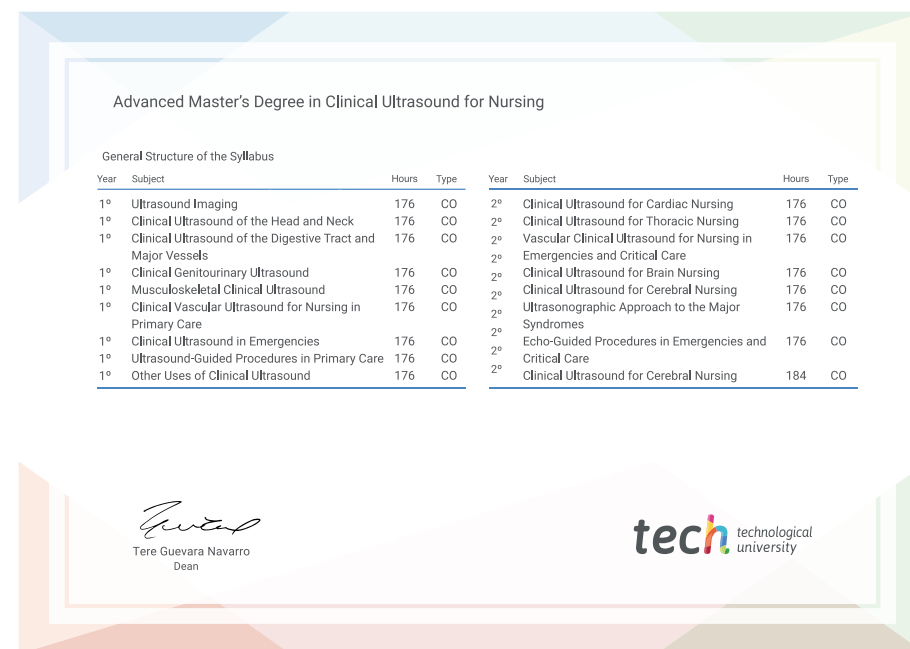
This **Advanced Master's Degree in Clinical Ultrasound for Nursing** contains the most complete and up-to-date scientific program on the market.

After the student has passed the assessments, they will receive their corresponding **Advanced Master's Degree** diploma issued by **TECH Technological University** via tracked delivery.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Advanced Master's Degree, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Advanced Master's Degree in Clinical Ultrasound for Nursing**

Official N° of hours: **3,000 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  
development languages  
classroom



## Advanced Master's Degree Clinical Ultrasound for Nursing

- » Modality: online
- » Duration: 2 years
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

# Advanced Master's Degree Clinical Ultrasound for Nursing