Professional Master's Degree

Clinical Ultrasound in Emergencies and Intensive Care

tech global university

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Professional Master's Degree

Clinical Ultrasound in Emergencies and Intensive Care

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/medicine/professional-master-degree/master-clinical-ultrasound-emergencies-intensive-care

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01

Introduction

In recent years, clinical ultrasound has experienced a great boost given its usefulness in complementing medical history and improving patient diagnoses. This is possible mainly due to the technology that has made it possible to reduce equipment and improve image quality. Faced with these advances, the medical professional must undoubtedly update their knowledge to provide the best possible care, especially in the field of emergencies and in patients requiring critical care. This 100% online program provides healthcare personnel with up-to-date and relevant knowledge in this area through innovative multimedia content that can be accessed whenever and wherever they wish.

With this Professional Master's Degree, you will get an update that will keep you abreast of developments in Clinical Ultrasound"

Diagnostic strategies have undergone changes with the revolution that technological progress has brought to medicine, but scientific studies have undoubtedly also had a significant influence on the early detection of certain diseases. Therefore, the conjunction of knowledge and progress go hand in hand in this process that, without a doubt, a medical professional must master. This Professional Master's Degree offers comprehensive and broad knowledge for the approach to patient care that requires Clinical Ultrasound in emergencies or intensive care.

A program that is taught exclusively online and is designed so that the professional can take it comfortably. Thus, students who decide to undertake this program will be introduced to clinical cardiac, thoracic, vascular, cerebral, abdominal or musculoskeletal ultrasound through multimedia didactic resources. In addition, healthcare personnel will be able to update their knowledge in the ultrasound approach to major syndromes, pediatric clinical ultrasound and ultrasound-guided procedures. All this with a *Relearning* system, used by TECH, so that students can progressively advance during the teaching, reducing even the long hours of study that are used in other methodologies.

The medical professional is, therefore, facing an excellent opportunity to renew their knowledge in a field in constant transformation and of great utility in their clinical practice. In order to take this course, you will only need an electronic device (cell phone, tablet or computer) to access the virtual platform where all the syllabus is hosted. Having the content available from the beginning allows students to distribute the teaching load according to their needs. This is why professionals can progress through this program at their own pace, making their work and personal responsibilities compatible with quality teaching

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

- The development of case studies presented by experts in Clinical Ultrasound
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

New technologies have improved clinical ultrasound, update your knowledge in this field thanks to the specialized teaching team of this program"

The clinical cases provided by the teaching team will be very useful in your daily practice"

Deepen the examination technique in pediatric, thoracic or cardiovascular ultrasound whenever and wherever you want.

Renew your knowledge in different types of ultrasound scanners and their most effective applications with this university program.

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

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 immersive training programmed 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 student will be assisted by an innovative interactive video system created by renowned and experienced experts.

02

Objectives

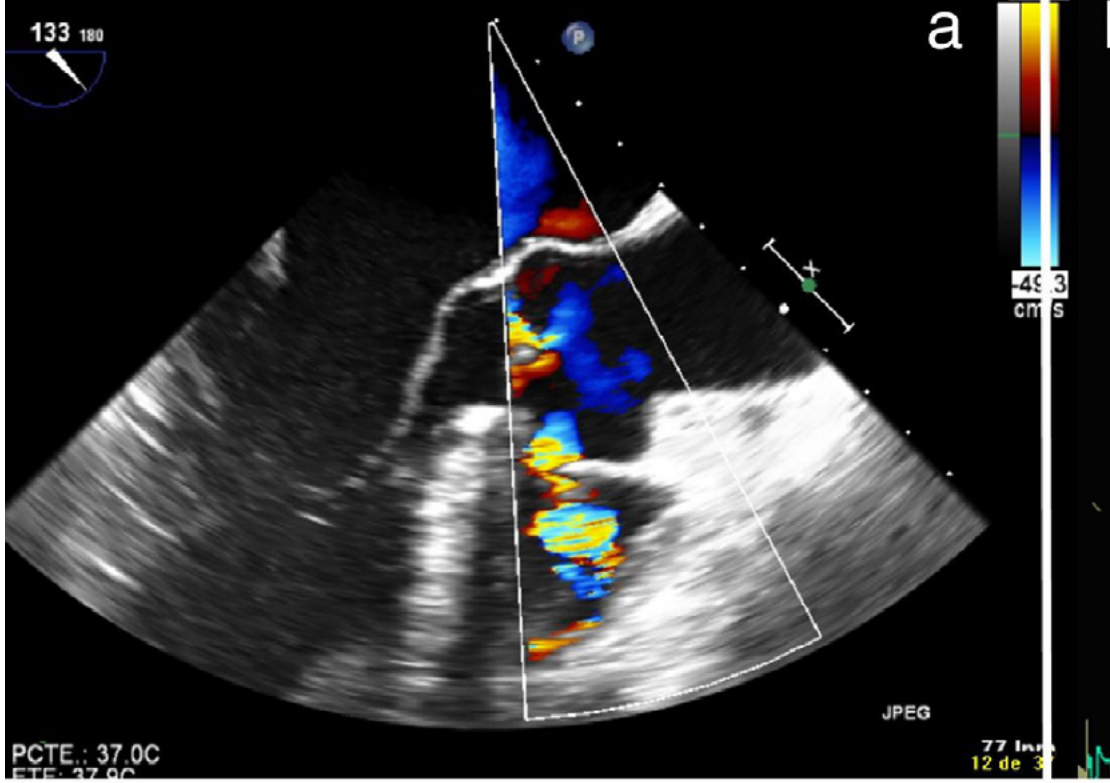
The main goal of this Professional Master's Degree is to offer the medical professional a renewal of their knowledge through a comprehensive content developed by a teaching team that has extensive experience in different medical specialties. Their extensive knowledge in this field will facilitate the updating of knowledge, allowing students to be aware of the latest technical requirements and their usefulness for patients with cardiac, thoracic, musculoskeletal or stroke conditions.

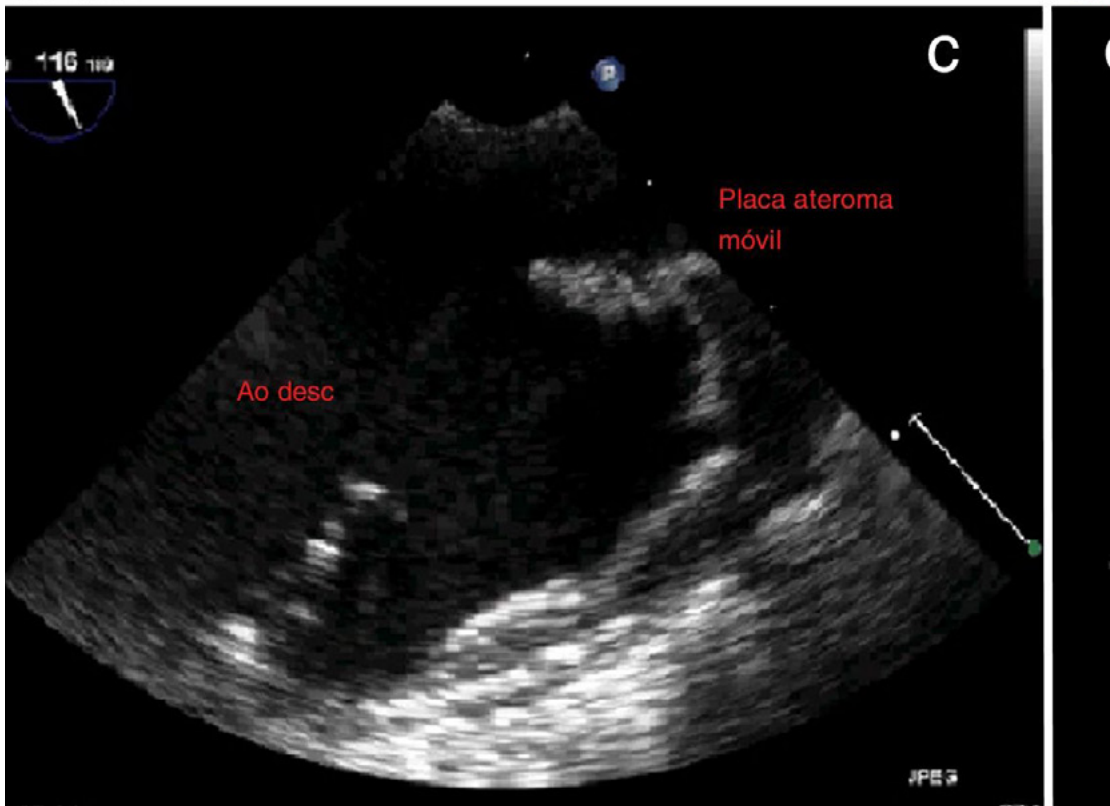
TECH offers you the opportunity to study a program in which you can distribute the course load according to your needs"

General Objective

- Complete the educational pathway by making physicians masters in the use of ultrasound for the management of emergency situations and critical patients, regardless of the environment in which they find themselves.

This program will provide you with a sense of confidence in medical practice, which will help you grow personally and professionally"





Specific Objectives

Module 1. Ultrasound imaging

- Define the physical principles which 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 echonavigation

Module 2. Clinical Cardiac Ultrasound

- Explain the cardiac anatomy
- Describe the technical requirements of cardiac ultrasound
- Explain localization and visualization in pericardial windows
- Describe sonoanatomy and sonophysiology in cardiac ultrasound
- Explain the different structural alterations to identify in cardiac ultrasound
- Define the principles of hemodynamic ultrasound

Module 3. Clinical Thoracic 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

Module 4. Clinical Vascular Ultrasound

- 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 peripheral arterial circulation ultrasound.

Module 5. Clinical Cerebral Ultrasound

- 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

Module 6. Clinical Abdominal Ultrasound

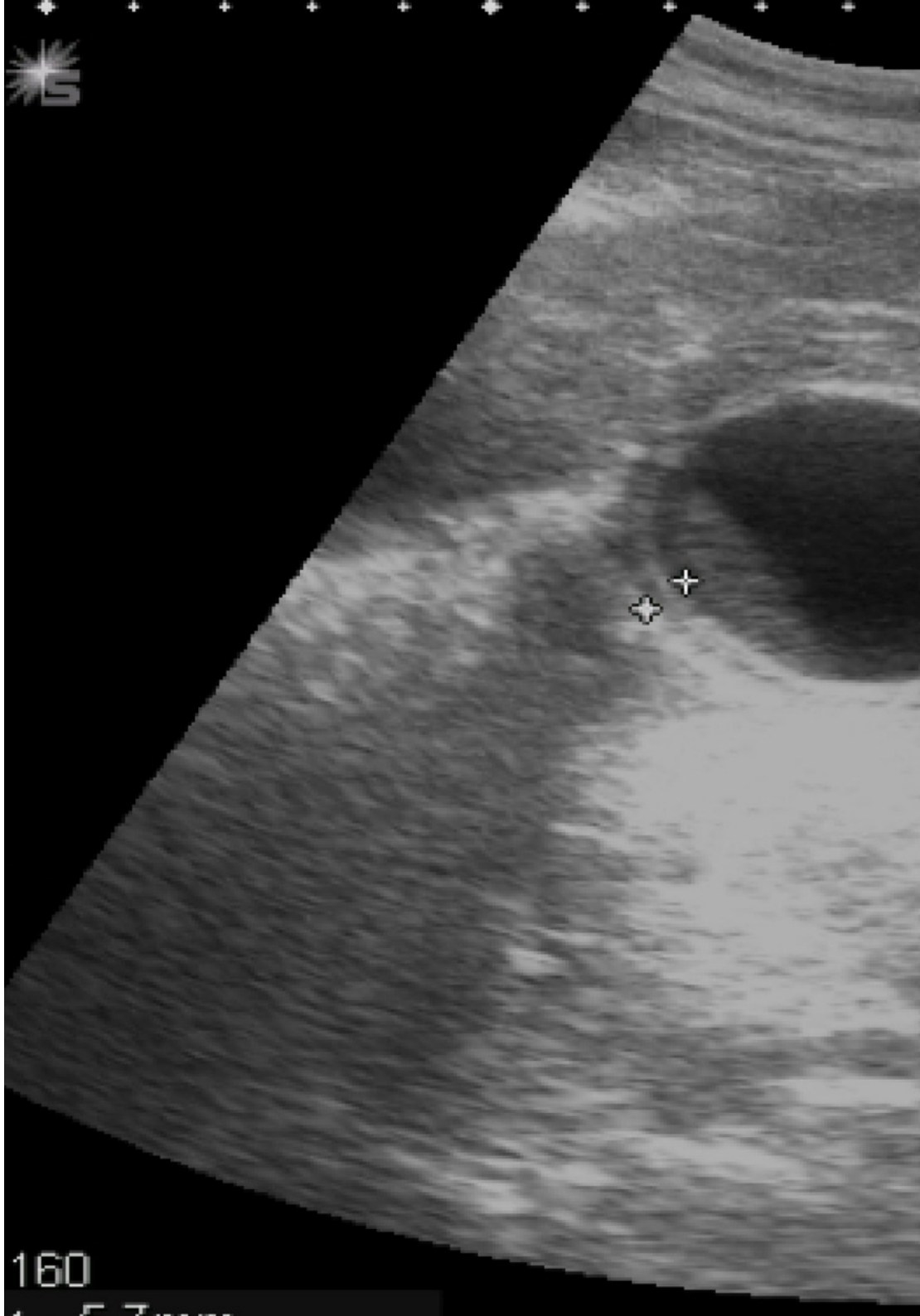
- Explain the abdominal anatomy
- Describe the technical requirements of abdominal ultrasounds
- Explain the examination technique for abdominal ultrasounds
- Explain the *ECO-FAST* methodology
- Explain the principles of ultrasound of the digestive tract.
- Explain the principles of genitourinary ultrasound.

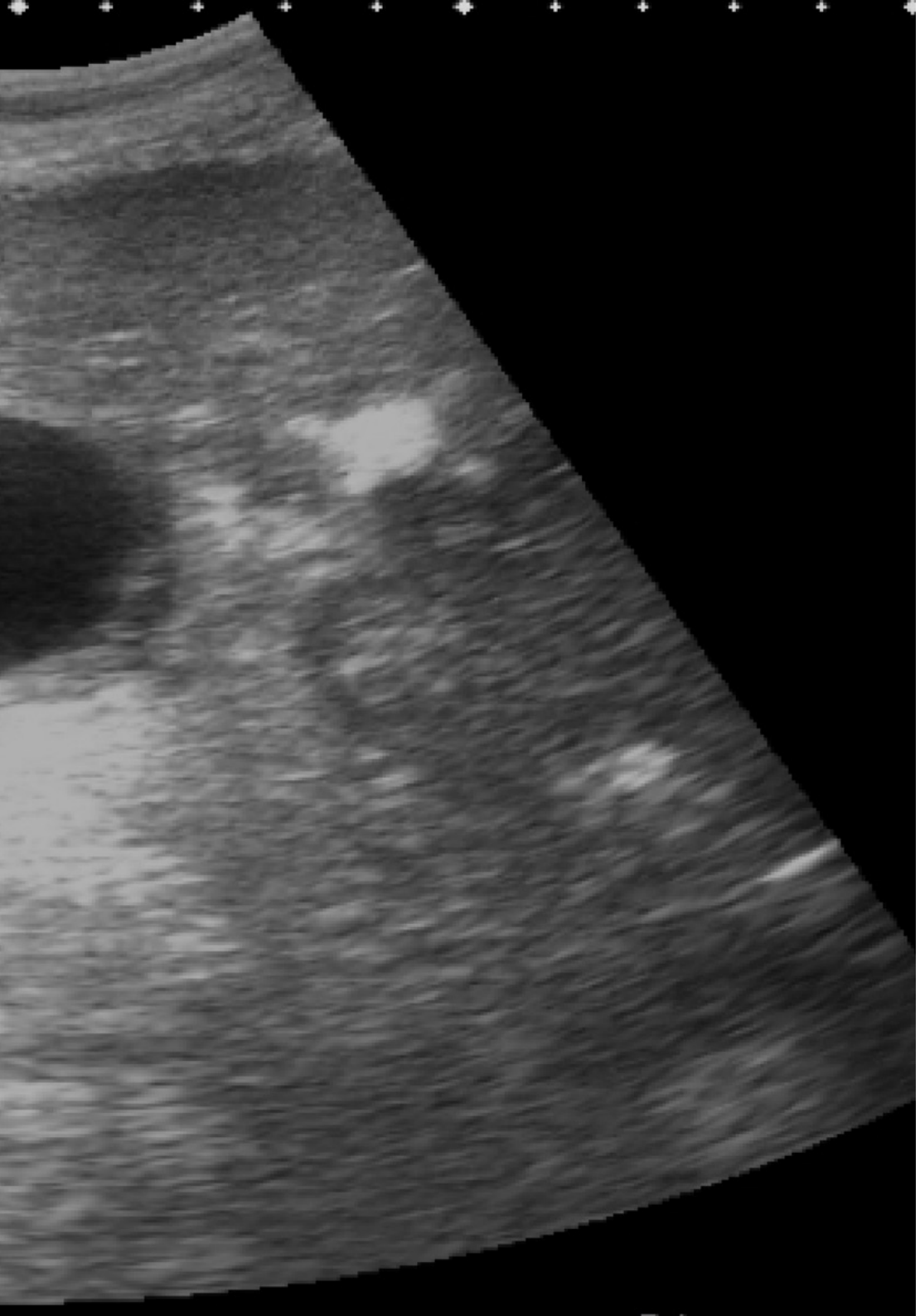
Module 7. Clinical Musculoskeletal Ultrasound

- Explain the anatomy of the musculoskeletal system
- Describe 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

Module 8. Ultrasound 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 9. 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

Module 10. Clinical Pediatric Ultrasound

- 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

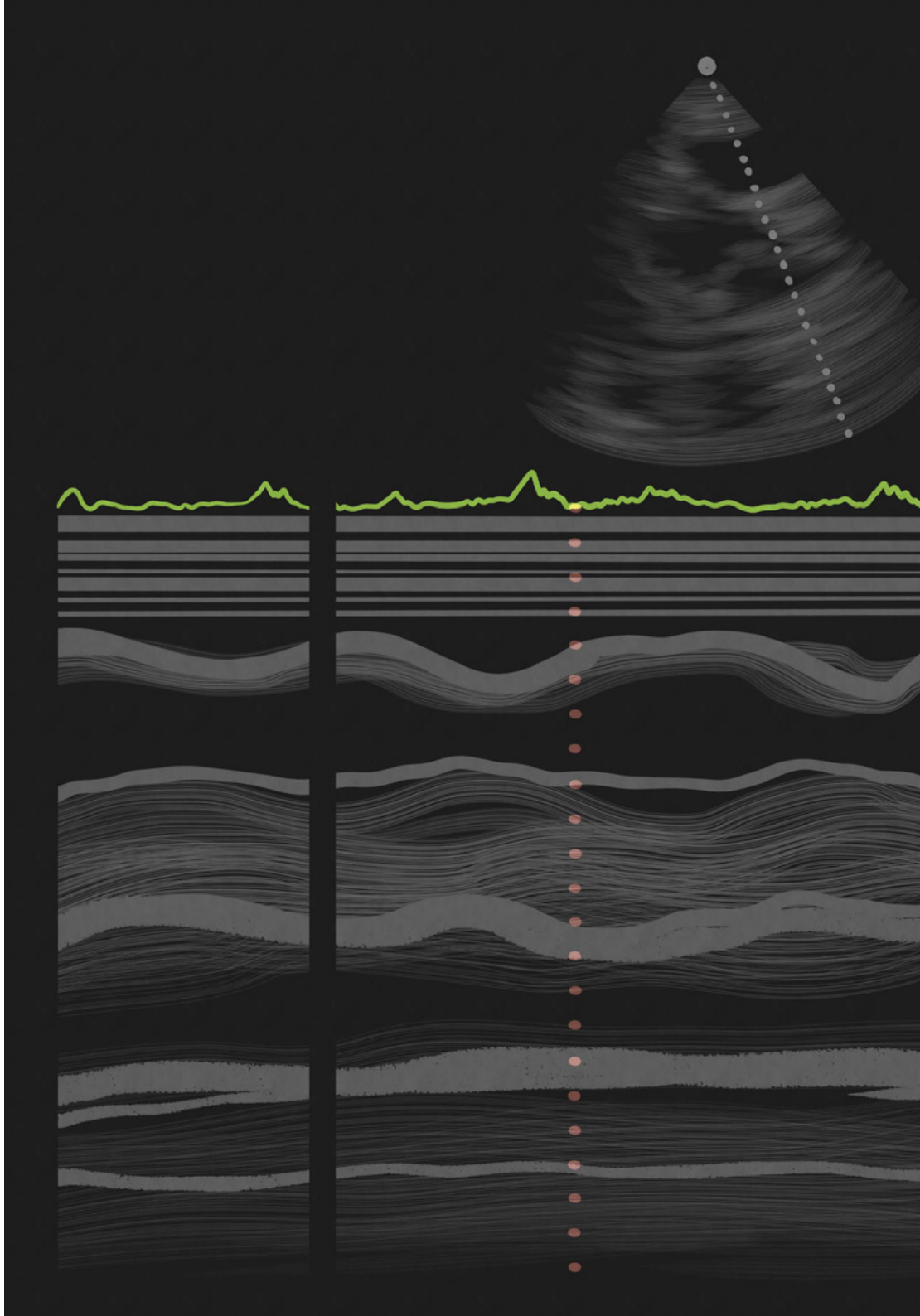
Skills

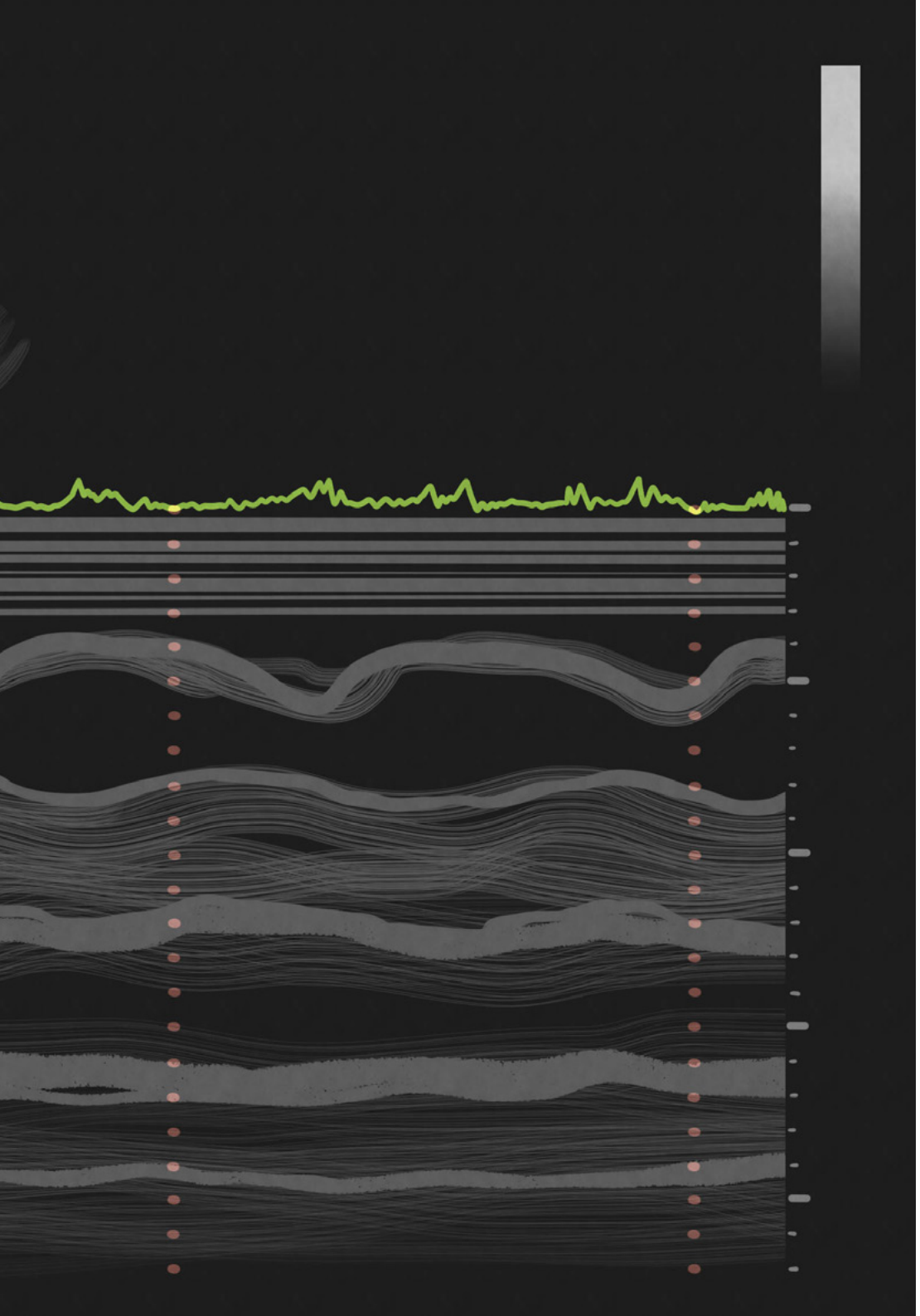
The medical professional who is part of this program will achieve at the end of the 12 months of duration, an updating of their skills in the mastery of basic and advanced ultrasound procedures, both diagnostic and therapeutic, in addition to obtaining an update on econavigation and the main techniques used in the most common clinical situations, knowing how to distinguish the limitations and advantages of its use.

Access the latest content on Clinical Ultrasound and refresh your knowledge on the safest ultrasound modalities for the patient"

General Skills

- Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context
- Know how to apply acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the area of study.
- Be able to integrate knowledge and face the complexity of making judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities related to the application of their knowledge and judgments
- Communicate their conclusions, with the knowledge and reasons that support them, to specialized and non-specialized audiences in a clear and unambiguous manner
- Acquire the learning skills that will enable the professional to continue studying in a manner that will be largely self-directed or autonomous





Specific Skills

- 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 non-invasively by using ultrasound, with the possibility of replacing them
- Guiding invasive therapeutic procedures to minimize their risks
- Understand how to extend the concept of Clinical Ultrasound to healthcare and academic environments

A qualification that will keep you abreast of the latest technical advances and allow you to minimize risks in invasive therapeutic procedures"

04

Course Management

The medical professional will have at their disposal in this program a multidisciplinary management and teaching staff with extensive experience in the field of Clinical Ultrasound. A specialized and knowledgeable faculty that also possesses human qualities. All these requirements have been taken into account in the meticulous selection that TECH carries out in all its programs, so that students always receive a high level of education, according to their needs and within everyone's reach.

A large team of specialists will be in charge of contributing their extensive knowledge to this Professional Master's Degree"

Management

Dr. Álvarez Fernández, Jesús Andrés

- Attending Physician of 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 SOCANEC
- Degree in Medicine and Surgery
- Specialist in Intensive Care Medicine.
- Doctor of Medicine (PhD)

Professors

Dr. Flores Herrero, Ángel

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

Dr. Lamarca Mendoza, María Pilar

- Attending Physician ofAngiology and Vascular Surgery. Toledo Hospital Complex.
- Degree in Medicine and Surgery

Dr. Fumadó Queral, Josep

- 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)
- Degree in Medicine and Surgery

Dr. Mora Rangil. Patricia

- Medical Specialist in Intensive Care Medicine Montecanal Clinic. Zaragoza
- Degree in Medicine and Surgery

Dr. Igeño Cano, José Carlos
- Specialist in Intensive Care Medicine.
- Head of Intensive Care and Emergency Services.
- Doctor at San Juan de Dios Hospital. Córdoba
- Member of the HU-CI Project
- Creator and Director of Course of Ecoguided Venous Canalization (CAVE)
- Degree in Medicine and Surgery

Dr. Jiménez Díaz, Fernando
- 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
- Degree in Medicine and Surgery

Dr. Martínez Crespo, Javier
- Specialist in Intensive Care Medicine.
- Radio Diagnostic Attending Physician.
- Doctor at the University Hospital of Getafe. Getafe, Madrid
- Associate Professor at the European University of Madrid.
- Collaborator of the Ecoclub of SOMIAMA
- Degree in Medicine and Surgery

Dr. Martínez Díaz, Cristina
- Specialist in Intensive Care Medicine.
- Attending Physician in Intensive Care Medicine.
- Degree in Medicine and Surgery

Dr. Núñez Reiz, Antonio
- Specialist in Intensive Care Medicine.
- Attending Physician in Intensive Medicine.
- Physician at University Hospital Clínico San Carlos, Madrid
- Collaborating Professor in the Specialist Degree in Thoracic Ultrasound at the Autonomous University of Barcelona.
- Collaborating Professor of SOCANECO
- Degree in Medicine and Surgery

Dr. Pérez Morales, Luis Miguel
- Physician Specialist in Family Medicine.
- Primary Care Doctor.
- Doctor at 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)
- Degree in Medicine and Surgery

Dr. Osiniri Kippes, María Inés
- Pediatrician.
- Pediatrics, Pediatric Ultrasound and Pediatric Nephrology Bofill Clinic Girona.
- Collaborating Professor at the Spanish School of Clinical Ultrasound.
- Member of the European Federation of Societies of Ultrasound in Medicine and Biology (EFSUMB)
- Degree in Medicine and Surgery

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

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

Dr. Abril Palomares, Elena
- Specialist in Intensive Care Medicine.
- Attending Physician of Intensive Care Medicine and Major Burns Unit.
- Doctor at the University Hospital of Getafe. Madrid, Spain
- Member of the Ecoclub of SOMIAMA.
- Degree in Medicine and Surgery

Dr. Álvarez González, Manuel
- Specialist in Intensive Care Medicine.
- Attending Physician in Intensive Medicine.
- Physician at the San Carlos University Hospital. Madrid
- Founding Member of the Ecoclub of SOMIAMA
- Degree in Medicine and Surgery

Dr. Colinas Fernández, Laura
- Specialist in Intensive Care Medicine.
- Assistant Physician of Intensive Care Medicine University Hospital Complex of Toledo
- Member of the Spanish Society for Ultrasound in Critical Cases (ECOCRITIC)
- Degree in Medicine and Surgery

Dr. De la Calle Reviriego, Braulio
- Specialist in Intensive Care Medicine.
- Head of Department in Intensive Medicine and Transplants Coordinator.
- Doctor at 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.
- Attending Physician of Intensive Care Medicine, Fundación de Alcorcón University Hospital, Madrid
- Degree in Medicine and Surgery

Dr. Herrero Hernández, Raquel
- Specialist in Intensive Care Medicine.
- Attending Physician of Intensive Care Medicine and Major Burns Unit.
- Doctor at the University Hospital of Getafe. Getafe, Madrid
- Member of the Ecoclub of SOMIAMA.
- Degree in Medicine and Surgery

Dr. López Cuenca, Sonia
- Specialist in Intensive Care Medicine.
- Attending Physician of Intensive Care Medicine and Major Burns Unit.
- Doctor at the University Hospital of Getafe. Madrid
- Member of the Ecoclub of SOMIAMA.
- Degree in Medicine and Surgery

Dr. Serna Gandía, María
- Medical Specialist in Anesthesiology and Resuscitation Denia-Marina Salud Hospital. Denia, Alicante
- Secretary of the Spanish Society for Ultrasound in Critical Cases (ECOCRITIC)
- Degree in Medicine and Surgery

Dr. López Rodríguez, Lucía
- Specialist in Intensive Care Medicine.
- Attending Physician of Intensive Care Medicine and Major Burns Unit.
- Doctor at the University Hospital of Getafe. Getafe, Madrid
- Member of the Ecoclub of SOMIAMA.
- Degree in Medicine and Surgery

Dr. Ortuño Andériz, Francisco
- Specialist in Intensive Care Medicine.
- Attending Physician in Intensive Medicine.
- Physician at the San Carlos University Hospital, Madrid
- Collaborating Professor of the Master's Degree in Intensive Care Medicine at the CEU Cardenal Herrera University of Valencia.
- Degree in Medicine and Surgery

Dr. Palacios Ortega, Francisco de Paula
- Specialist in Intensive Care Medicine.
- Attending Physician of Intensive Care Medicine and Major Burns Unit.
- Doctor at the University Hospital of Getafe. Madrid. Collaborating Professor at the University of Madrid.
- Founding Member of the Ecoclub of SOMIAMA
- Degree in Medicine and Surgery

Dr. Phillipps Fuentes, Federico
- Medical Specialist in Pediatrics Hospital Perpetuo Socorro. Las Palmas de Gran Canaria
- Vice-President of the Canaries Society for Ultrasound (SOCANECO)
- Member of the European Federation of Societies of Ultrasound in Medicine and Biology (EFSUMB)
- Degree in Medicine and Surgery

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

Dr. Villa Vicente, Gerardo
- 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)
- Degree in Medicine and Surgery

Dr. Yus Teruel, Santiago
- Specialist in Intensive Care Medicine.
- Assistant Physician of Intensive Care Medicine, La Paz-Carlos III University Hospital Complex. Madrid
- Member of the Ecoclub of SOMIAMA.
- Degree in Medicine and Surgery

05

Structure and Content

The teaching material (video summaries, detailed videos, interactive diagrams) and the clinical cases provided by the teaching team are resources that will facilitate the updating of knowledge in a more dynamic way and closer to the usual clinical reality of the medical professional. You will find this content in the 10 modules that make up this Professional Master's Degree and you will be able to access it 24 hours a day. From the beginning and until the conclusion of the 1,500 hours of this course, the professional will study ultrasound imaging in depth, taking into account the different cases that may be present in emergencies and in different population groups. A wide range of options, which undoubtedly further enrich the knowledge that students gain from this program.

An exhaustive syllabus with the most innovative teaching tools to keep you up to date with the latest developments in ultrasound imaging"

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. Echography
- 1.4.1. Console Echograph Ultrasound Scanners
- 1.4.2. Portable Echograph Ultrasound scanners
- 1.4.3. Specialised Echograph Ultrasound Scanners
- 1.4.4. Transducers

1.5. Ultrasound Maps and Echo 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 Cardiac Ultrasound

2.1. Cardiac Anatomy
- 2.1.1. Basic Three-Dimensional Anatomy.
- 2.1.2. Basic Cardiac Physiology

2.2. Technical Requirements to Perform a Cardiac Ultrasound
- 2.2.1. Probes
- 2.2.2. Characteristics of the Equipment Used in a Cardiac Ultrasound

2.3. Perineal Windows and Cardiac Ultrasound
- 2.3.1. Windows and Maps Applied in Emergencies and Intensive Care Situations
- 2.3.2. Basic Doppler (Color, Pulsating, Continuous and Tissue Doppler).

2.4. Structural Alterations
- 2.4.1. Basic Measurements in Cardiac Ultrasound
- 2.4.2. Thrombi
- 2.4.3. Suspected Endocarditis
- 2.4.4. Valvulopathies
- 2.4.5. Pericardium
- 2.4.6. How is an Ultrasound Reported in Emergency and Intensive Care?

2.5. Hemodynamic Ultrasound.
- 2.5.1. Left Ventricular Hemodynamics
- 2.5.2. Right Ventricular Hemodynamics
- 2.5.3. Preload Dynamic Tests

2.6. Transesophageal Echocardiogram
- 2.6.1. Technique
- 2.6.2. Indications in Emergencies and Intensive Care Cases
- 2.6.3. Ultrasound-Guided Study of Cardioembolism.

Module 3. Clinical Thoracic Ultrasound

3.1. Anatomy Recap.
- 3.1.1. Study of the Normal Thorax
- 3.1.2. Pulmonary Ultrasound Semiology
- 3.1.3. Pleural Ultrasound Semiology

3.2. Technical Requirements
- 3.2.1. Types of Probes Used
- 3.2.2. Ultrasound with Contrast in the Thorax

3.3. Examination Technique
- 3.3.1. Exploration of Pulmonary Pathology
- 3.3.2. Exploration of Pleural Pathology
- 3.3.3. Exploration of Mediastinal and Thoracic Wall Pathology

3.4. Ultrasound of Thoracic Wall, Pleura and Mediastinum
- 3.4.1. Pleural Effusion and Solid Pleural Pathology
- 3.4.2. Pneumothorax
- 3.4.3. Pleural Interventionism
- 3.4.4. Adenopathies and Mediastinal Masses
- 3.4.5. Adenopathies of the Thoracic Wall
- 3.4.6. Musculoskeletal Pathology of the Thoracic Wall

3.5. Pulmonary Ultrasound Scan
- 3.5.1. Pneumonia and Atelectasis
- 3.5.2. Pulmonary Neoplasms
- 3.5.3. Diffuse Lung Pathology
- 3.5.4. Pulmonary Infarction

3.6. Diaphragmatic Ultrasound
- 3.6.1. Ultrasound Approach to Diaphragmatic Pathology
- 3.6.2. Usefulness of Ultrasound in the Study of the Diaphragm

Module 4. Clinical Vascular Ultrasound

4.1. Anatomy Recap.
- 4.1.1. Venous Vascular Anatomy of the Upper Limbs
- 4.1.2. Arterial Vascular Anatomy of the Upper Limbs
- 4.1.3. Venous Vascular Anatomy of the Lower Limbs
- 4.1.4. Arterial Vascular Anatomy of the Lower Limbs

4.2. Technical Requirements
- 4.2.1. Ultrasound Scanners and Probes
- 4.2.2. Curve Analysis
- 4.2.3. Image-Color Media
- 4.2.4. Echocontrast

4.3. Examination Technique
- 4.3.1. Positioning.
- 4.3.2. Insonation. Examination Technique
- 4.3.3. Study of Normal Curves and Speeds

4.4. Large Thoracoabdominal Vessels
- 4.4.1. Venous Vascular Anatomy of the Abdomen
- 4.4.2. Arterial Vascular Anatomy of the Abdomen
- 4.4.3. Abdomino-Pelvic Venous Pathology
- 4.4.4. Abdomino-Pelvic Arterial Pathology

4.5. Supra-Aortic Trunks
- 4.5.1. Venous Vascular Anatomy of the Supra-Aortic Trunks.
- 4.5.2. Arterial Vascular Anatomy of the Supra-Aortic Trunks.
- 4.5.3. Venous Pathology of the Supra-Aortic Trunks.
- 4.5.4. Arterial Pathology of the Supra-Aortic Trunks.

4.6. Peripheral arterial and Venous Circulation
- 4.6.1. Venous Pathology of Lower and Upper Limbs
- 4.6.2. Arterial Pathology of Lower and Upper Limbs

Module 5. Clinical Cerebral Ultrasound

5.1. Cerebral Hemodynamics
- 5.1.1. Carotid Circulation
- 5.1.2. Vertebrobasilar Circulation
- 5.1.3. Cerebral Microcirculation

5.2. Ultrasound Modes
- 5.2.1. Transcranial Doppler
- 5.2.2. Cerebral Ultrasound
- 5.2.3. Special Tests (vascular reaction, HITS, etc.)

5.3. Ultrasound Windows and Examination Technique
- 5.3.1. Ultrasound Windows
- 5.3.2. Operator Position
- 5.3.3. Study Sequence

5.4. Structural Alterations
- 5.4.1. Collections and Masses
- 5.4.2. Vascular Anomalies.
- 5.4.3. Hydrocephalus
- 5.4.4. Venous Pathology

5.5. Hemodynamic Alterations
- 5.5.1. Spectral Analysis
- 5.5.2. Hyperdynamics
- 5.5.3. Hypodynamics
- 5.5.4. Asystole of the Brain

5.6. Ocular Ultrasonography
- 5.6.1. Pupil Size and Reactivity
- 5.6.2. Diameter of the Optic Nerve Sheath

Module 6. Clinical Abdominal Ultrasound

6.1. Anatomy Recap.
- 6.1.1. Abdominal Cavity
- 6.1.2. Liver
- 6.1.3. Gallbladder and Bile Ducts
- 6.1.4. Retroperitoneum and Great Vessels
- 6.1.5. Pancreas.
- 6.1.6. Bladder
- 6.1.7. Kidneys
- 6.1.8. Bladder
- 6.1.9. Prostate and Seminal Vesicles
- 6.1.10. Uterus and Ovaries

6.2. Technical Requirements
- 6.2.1. Ultrasound Equipment
- 6.2.2. Types of Transductors for Abdominal Examination
- 6.2.3. Basic Ultrasound Settings
- 6.2.4. Patient Preparation

6.3. Examination Technique
- 6.3.1. Study Maps
- 6.3.2. Probe Movements
- 6.3.3. Visualization of Organs According to Conventional Sectioning
- 6.3.4. Systematic Study

6.4. *ECO-FAST* Methodology
- 6.4.1. Equipment and Transducers
- 6.4.2. *ECO-FAST* I
- 6.4.3. *ECO-FAST* II
- 6.4.4. *ECO-FAST* III. Perivesical Effusion
- 6.4.5. *ECO-FAST* IV. Pericardial Effusion
- 6.4.6. *ECO-FAST* V. Exclude Aortic Aneurysm ABD

6.5. Ultrasound Scan of the Digestive System
- 6.5.1. Liver
- 6.5.2. Gallbladder and Bile Ducts
- 6.5.3. Pancreas.
- 6.5.4. Bladder

6.6. Genitourinary Ultrasound
- 6.6.1. Kidney
- 6.6.2. Urinary Bladder
- 6.6.3. Male Genital System
- 6.6.4. Female Genital System

Module 7. Clinical Musculoskeletal Ultrasound

7.1. Anatomy Recap
7.2. Technical Requirements
7.3. Examination Technique
7.4. Sonoanatomy of the Locomotor System: I. Upper Extremities
7.5. Sonoanatomy of the Locomotor System: II. Lower Extremities
7.6. Ultrasound in the Most Frequent Acute Locomotor System Injuries

Module 8. Ultrasound Approach to Major Syndromes

8.1. Cardiac Arrest
- 8.1.1. Cerebral Hemodynamics
- 8.1.2. Brain Damage in Cardiac Arrest
- 8.1.3. Usefulness of Ultrasound in Resuscitation
- 8.1.4. Usefulness of Ultrasound After Recovery of Spontaneous Circulation

8.2. Shock
- 8.2.1. Ventricular Filling Pressure
- 8.2.2. Cardiac Output
- 8.2.3. Prediction of the Hemodynamic Response to Intravascular Volume Administration
- 8.2.4. Ultrasound Evaluation of Pulmonary Edema
- 8.2.5. Ultrasound Search for Sources of Sepsis

8.3. Respiratory Failure
- 8.3.1. Acute Respiratory Failure: Diagnosis
- 8.3.2. Abrupt Hypoxemia in Patients on Mechanical Ventilation
- 8.3.3. Monitoring of Recruitment Maneuvers
- 8.3.4. Evaluation of Extravascular Lung Water

8.4. Acute Renal Failure.
- 8.4.1. Hydronephrosis
- 8.4.2. Lithiasis
- 8.4.3. Acute Tubular Necrosis
- 8.4.4. Doppler Ultrasound in Acute Renal Failure
- 8.4.5. Seminal Vesicle Ultrasound in Acute Renal Failure

8.5. Trauma
- 8.5.1. *FAST and E-FAST* (Hemo and Pneumothorax)
- 8.5.2. Ultrasound Evaluation in Special Situations
- 8.5.3. Hemodynamic Evaluation Focused on Trauma

8.6. Stroke
- 8.6.1. Justification
- 8.6.2. Initial Assessment
- 8.6.3. Ultrasound Assessment.
- 8.6.4. Ultrasound-Guided Management.

Module 9. Ultrasound-Guided Procedures

9.1. Airway
- 9.1.1. Advantages and Indications
- 9.1.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy.
- 9.1.3. Orotracheal Intubation Technique
- 9.1.4. Percutaneous Tracheotomy Technique
- 9.1.5. Common Problems, Complications, and Practical Advice

9.2. Vascular Cannulation
- 9.2.1. Indications and Advantages of the Anatomical Reference Technique
- 9.2.2. Current Evidence on Ultrasound-Guided Vascular Cannulation.
- 9.2.3. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy.
- 9.2.4. Ultrasound-Guided Central Venous Cannulation Technique.
- 9.2.5. Single Peripheral Catheter and Peripherally Inserted Central Catheter (PICC) Cannulation Technique
- 9.2.6. Arterial Cannulation Technique
- 9.2.7. Implementation of an Ultrasound-Guided Vascular Cannulation Protocol.
- 9.2.8. Common Problems, Complications, and Practical Advice

9.3. Pericardiocentesis and Thoracentesis
- 9.3.1. Indications and Advantages of the Anatomical Reference Technique
- 9.3.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy.
- 9.3.3. Ultrasound Specifications and Pericardial Drainage Technique
- 9.3.4. Ultrasound Specifications and Thoracic Drainage Technique
- 9.3.5. Common Problems, Complications, and Practical Advice

9.4. Paracentesis
- 9.4.1. Indications and Advantages of the Anatomical Reference Technique
- 9.4.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy.
- 9.4.3. Ultrasound Specifications and Technique
- 9.4.4. Common Problems, Complications, and Practical Advice

9.5. Lumbar Puncture
- 9.5.1. Indications and Advantages of the Anatomical Reference Technique
- 9.5.2. Basic Aspects: Ultrasound Specifications and Ultrasound Anatomy.
- 9.5.3. Technique
- 9.5.4. Common Problems, Complications, and Practical Advice

9.6. Other Drainage and Probing
- 9.6.1. Suprapubic Probing
- 9.6.2. Collection Drainage
- 9.6.3. Extraction of Foreign Bodies

Module 10. Clinical Pediatric Ultrasound

10.1. Technical Requirements
- 10.1.1. Ultrasound at the Patient's Bedside.
- 10.1.2. Physical Space
- 10.1.3. Basic Equipment
- 10.1.4. Equipment for Interventionalist Ultrasounds
- 10.1.5. Ultrasound Scanners and Probes

10.2. Examination Technique
- 10.2.1. Pediatric Patient Preparation
- 10.2.2. Tests and Probes
- 10.2.3. Ultrasound Section Maps
- 10.2.4. Examination System
- 10.2.5. Ultrasound-Guided Procedures
- 10.2.6. Images and Documentation
- 10.2.7. Test Report

10.3. Pediatric Sonoanatomy and Sonophysiology
- 10.3.1. Normal Anatomy
- 10.3.2. Sonoanatomy
- 10.3.3. Sonophysiology of a Child in the Different Stages of Development
- 10.3.4. Variants of Normality
- 10.3.5. Dynamic Ultrasound

10.4. Ultrasound of the Major Pediatric Syndromes
- 10.4.1. Emergency Thorax Ultrasound
- 10.4.2. Acute Abdomen
- 10.4.3. Acute Scrotum

10.5. Ultrasound-Guided Procedures in Pediatrics
- 10.5.1. Vascular Access
- 10.5.2. Extraction of Superficial Foreign Bodies
- 10.5.3. Pleural Effusion

10.6. Introduction to Neonatal Clinical Ultrasound
- 10.6.1. Emergency Transfontanellar Ultrasound
- 10.6.2. Most Common Examination Indications in Emergencies
- 10.6.3. Most Common Pathologies in Emergencies

06

Methodology

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

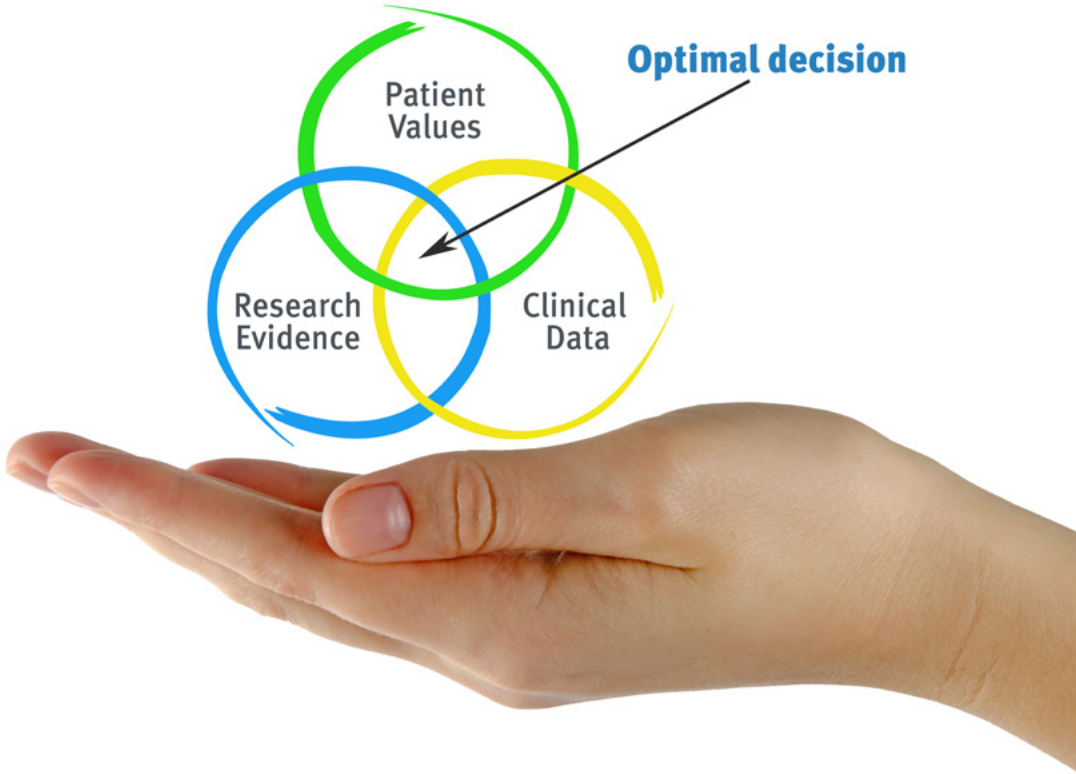
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

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

At TECH we use the Case Method

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

With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.



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

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

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

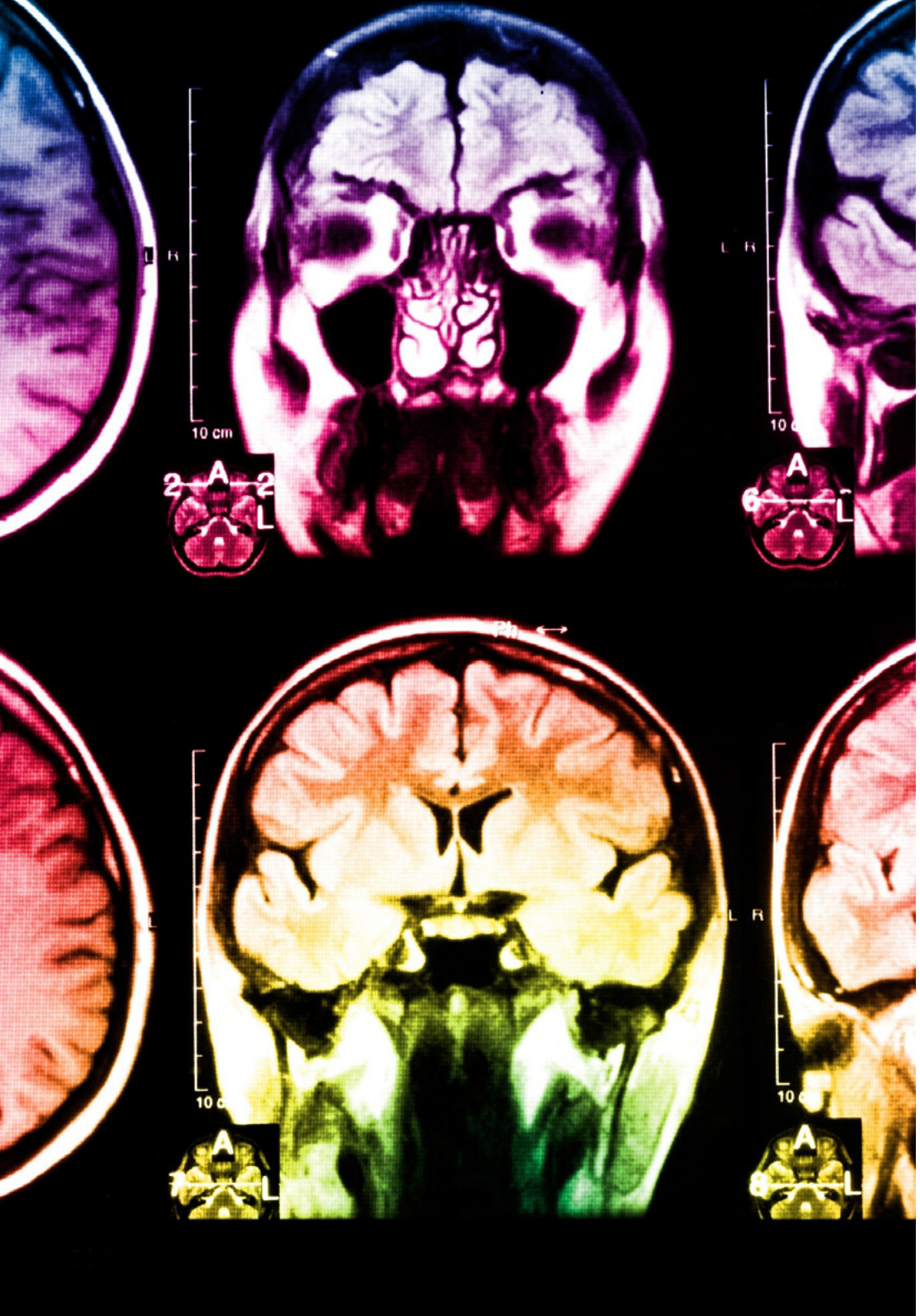
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

Relearning Methodology

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

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

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



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

With this methodology, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

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

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

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

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

Study Material

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

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

Surgical Techniques and Procedures on Video

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

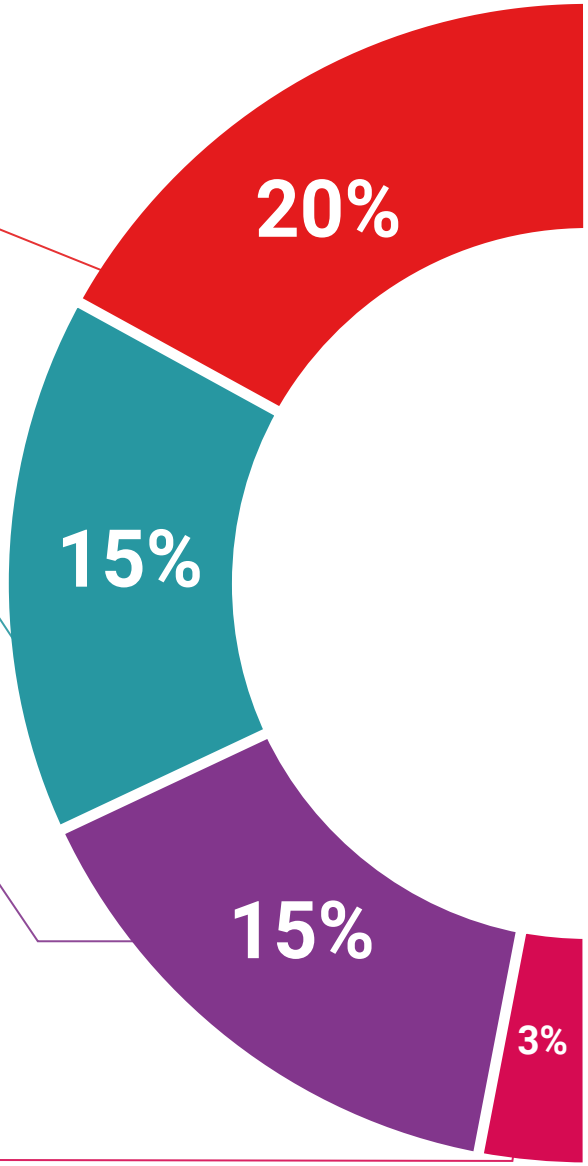
Interactive Summaries

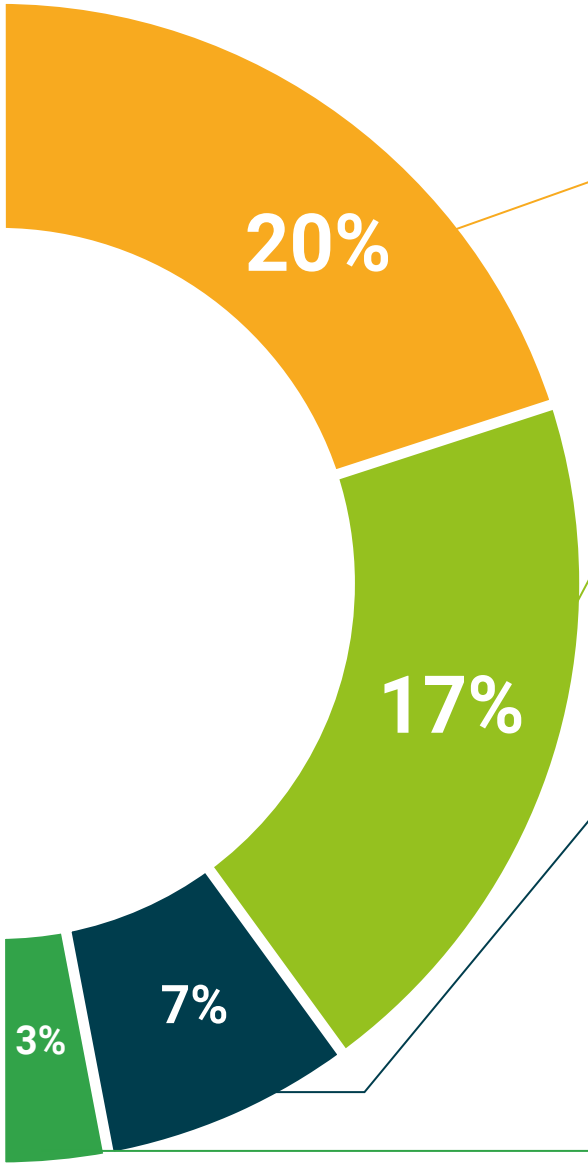
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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

Additional Reading

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





Expert-Led Case Studies and Case Analysis

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

Testing & Retesting

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

Classes

There is scientific evidence on the usefulness of learning by observing experts. The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

Quick Action Guides

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

07

Certificate

The Professional Master's Degree in Clinical Ultrasound in Emergencies and Critical Care guarantees you, in addition to the most rigorous and updated training, access to a Professional Master's Degree issued by TECH Global University.

Successfully complete this program and receive your university degree without travel or laborious paperwork"

This private qualification will allow you to obtain a **Professional Master's Degree diploma in Clinical Ultrasound in Emergencies and Intensive Care** endorsed by **TECH Global University**, the world's largest online university.

TECH Global University is an official European University publicly recognized by the Government of Andorra (***official bulletin***). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** private qualification is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Professional Master's Degree in Clinical Ultrasound in Emergencies and Intensive Care**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**


tech global university

Mr./Ms. _____ with identification document _____
has successfully passed and obtained the title of:

Professional Master's Degree in Clinical Ultrasound in Emergencies and Intensive Care

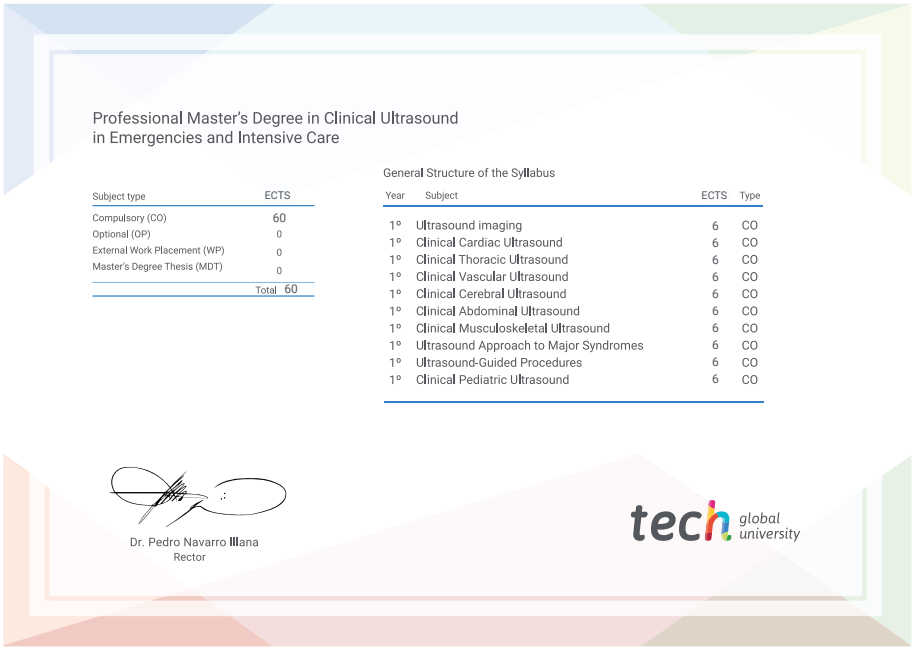
This is a private qualification of 1,800 hours of duration equivalent to 60 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates


Professional Master's Degree in Clinical Ultrasound in Emergencies and Intensive Care

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
Total	60

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Ultrasound imaging	6	CO
1º	Clinical Cardiac Ultrasound	6	CO
1º	Clinical Thoracic Ultrasound	6	CO
1º	Clinical Vascular Ultrasound	6	CO
1º	Clinical Cerebral Ultrasound	6	CO
1º	Clinical Abdominal Ultrasound	6	CO
1º	Clinical Musculoskeletal Ultrasound	6	CO
1º	Ultrasound Approach to Major Syndromes	6	CO
1º	Ultrasound-Guided Procedures	6	CO
1º	Clinical Pediatric Ultrasound	6	CO

Dr. Pedro Navarro Illana
Rector

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*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

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Professional Master's Degree

Clinical Ultrasound in Emergencies and Intensive Care

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Professional Master's Degree

Clinical Ultrasound in Emergencies and Intensive Care

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