

# Hybrid Professional Master's Degree

## Cardiovascular Critical Care in the ICU



## Hybrid Professional Master's Degree Cardiovascular Critical Care in the ICU

Course Modality: Hybrid (Online + Clinical Internship)

Duration: 12 months

Certificate: TECH Technological University

Teaching Hours: 1,620 h.

Website: [www.techtute.com/us/medicine/hybrid-professional-master-degree/hybrid-professional-master-degree-cardiovascular-critical-care-icu](http://www.techtute.com/us/medicine/hybrid-professional-master-degree/hybrid-professional-master-degree-cardiovascular-critical-care-icu)

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# 01

# Introduction

In recent years, cardiovascular care in the ICU service has improved the response capacity to different pathologies, resulting in a favorable prognostic evolution of many of them. These changes, supported by very relevant advances in biological knowledge and available medical technology, make it essential for the professional to update his knowledge. This will allow you to incorporate all these advances into your practice. In this sense, TECH has created this program, which provides medical professionals with a 100% online theoretical experience and a practical stay, which will take them to the hospital reality of a first level center.



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*A Hybrid Professional Master's Degree that will take you from theory to practice allowing you to keep abreast of the latest procedures and techniques in the area of Cardiovascular Critical Care in the ICU"*

The reasons why Cardiovascular Critical Care in the ICU is one of the medical disciplines that has made most progress in knowledge and technology in recent decades lie in the integration of biological and clinical knowledge, which has led to a better understanding of the mechanisms of disease, facilitating the development of more appropriate guidelines for clinical action.

All this has contributed to the fact that Cardiovascular Critical Care in the ICU has reached a notable degree of maturity and justifies its permanence in the future as an integrated specialty, this being the ideal framework for the global improvement of specialists.

It is therefore essential for physicians to be able to respond adequately to this evolution of scientific and technological knowledge, and to the evolution of their field of action in the different healthcare systems, by means of appropriate training. Along these lines, TECH has created this Hybrid Professional Master's Degree in Cardiovascular Critical Care in the ICU.

A program with a theoretical stage 100% online, which will take you through multimedia educational content to deepen the management of the critically ill patient, through the use of the most innovative techniques, tools and methods. All this under the maximum scientific rigor and with an advanced syllabus.

Once the professional concludes this phase, they will enter into a practical stay in a prestigious hospital center, which will provide a direct and real vision of the knowledge updated with the syllabus. An ideal scenario for the healthcare professional who wishes to be up to date in this area, through the best specialists. TECH thus offers an excellent opportunity to be up to date in Cardiovascular Critical Care in the ICU Service through a program, which is at the forefront.

This **Hybrid Professional Master's Degree in Cardiovascular Critical Care in the ICU** contains the most complete and up-to-date educational program on the market. The most important features include:

- ♦ Development of more than 100 clinical cases presented by professionals in this area of work and university professors with extensive experience and experience. 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
- ♦ Comprehensive systematized action plans for major pathologies
- ♦ Presentation of practical workshops on procedures diagnosis, and treatment techniques
- ♦ An algorithm-based interactive learning system for decision-making in the clinical situations presented throughout the course
- ♦ Practical clinical guides on approaching different pathologies
- ♦ Special emphasis on test-based medicine and research methodologies
- ♦ All of this will be complemented by theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ♦ Content that is accessible from any fixed or portable device with an Internet connection
- ♦ In addition, you will be able to carry out a clinical internship in one of the best hospitals in the world



*Enjoy an intensive 3-week stay in a prestigious clinical center and acquire with TECH the updated knowledge you are looking for"*

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*This Hybrid Professional Master's Degree will take you on a practical stay in a top level clinical center, allowing you to integrate into your daily practice the most advanced techniques in the care of critical cardiovascular patients"*

In this Hybrid Professional Master's Degree proposal, of a professionalizing nature and blended learning modality, the program is aimed at updating medical professionals who perform their functions in cardiovascular critical care units, and who require a high level of qualification. The contents are based on the latest scientific evidence, and oriented in a didactic way to integrate theoretical knowledge into medical practice, and the theoretical-practical elements will facilitate the updating of knowledge and will allow decision making in patient management.

Thanks to its multimedia content developed with the latest educational technology, they will allow the medical professional a situated and contextual learning, that is to say, a simulated environment that will provide an immersive learning 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 experts.

*This program combines theory and practice, adapting to the knowledge update needs of professionals specialized in ICU patient care.*

*TECH provides you with multimedia didactic resources that will introduce you to the most notorious advances in palliative and corrective surgical techniques.*



02

# Why Study this Hybrid Professional Master's Degree?

TECH, aware of the needs of medical professionals, has designed a program that breaks the current academic paradigm. Thus, it offers a university program that provides a current vision on the management of the critical cardiovascular patient in the ICU service, through a 100% online and flexible combination of theory and a practical stay in a leading hospital center. This will provide the health professional with advanced knowledge from the hand of an expert teaching team and medical professionals, who will accompany him/her during the 3 intensive weeks of practical stay. A unique opportunity that only this academic institution could offer.







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*TECH responds to the demands of medical professionals and has created a program with a theoretical-practical perspective that breaks away from traditional teaching programs"*

### **1. Updating from the latest available techniques**

The area of Cardiovascular Critical Care in the ICU Service has been revolutionized in recent years thanks to advances such as echocardiography, invasive mechanical ventilation, or palliative and corrective surgical techniques. For this reason, and with the aim of bringing the specialist closer to this technology, TECH presents this university program with which the professional will learn about the latest advances, through an advanced syllabus and a stay in a state-of-the-art clinical environment.

### **2. Gaining In-Depth Knowledge from the Experience of Top Specialists**

TECH has brought together in this program a specialized management and teaching staff with extensive experience in cardiovascular critical care units. Their knowledge is reflected in the syllabus, but this institution has gone a step further and has integrated a stay in this program, where the professional will be tutored by excellent medical professionals from a prestigious clinical center. This will allow you to update your knowledge over a 12-month period.

### **3. Entering First-Class Clinical Environments**

TECH carefully selects all available centers for Internship Programs. Thanks to this, the specialist will have guaranteed access to a prestigious clinical environment in the area of Cardiovascular Critical Care in the ICU Service. In this way, you will be able to integrate into your daily performance the most effective techniques and methodologies for patient management in situations of maximum complexity.





#### 4. Combining the Best Theory with State-of-the-Art Practice

TECH has opted in this Hybrid Professional Master's Degree to innovate in the methodology used, adapting as much as possible to the real needs of medical professionals. Thus, it offers a new model of knowledge updating, in a theoretical framework 100% online and a practical part 100% face-to-face in a relevant hospital center. This will allow him to be in charge of state-of-the-art procedures in the area of Cardiovascular Critical Care in the ICU.

#### 5. Expanding the Boundaries of Knowledge

The medical professional who enters this program will acquire a rigorous, current and exhaustive knowledge, which will be a before and after in his career. TECH has designed this program so that healthcare professionals can update their skills in Critical Cardiovascular Care in the ICU Service, allowing them to integrate these procedures in the best hospitals in the world.



*You will have full hands-on immersion at the center of your choice"*

# 03 Objectives

The objective of this program is to provide the professional with a complete update of the diagnostic and therapeutic procedures of the specialty. For this, the theoretical learning of the subject will be provided, with the most current and interesting contents in this sector, to finish with a hospital stay in which you will carry out the practical learning, with the help of recognized professionals in a hospital center of the highest scientific quality and technological innovation.



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*This program will keep you up to date on the latest cardiac pacing devices employed in the acute phase”*



## General Objective

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- Given the recent advances in Cardiovascular Critical Care in the ICU, both in terms of protocols and techniques and procedures, there is an urgent need for a complete update on the part of professionals working in this area. For this reason, the general objective of this Hybrid Professional Master's Degree has been to condense in a single educational itinerary, composed of a theoretical-practical phase and an on-site stay, all the novelties in this field



*An academic option that shows you through dynamic didactic material the advances in the treatment of myocarditis, pericarditis and pericardial effusion"*



## Specific Objectives

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### Module 1. Management of a Critical Patient with Heart Failure and Cardiogenic Shock

- Explain the anatomical and functional alterations present in heart failure
- Explain the echocardiographic manifestations corresponding to these pathophysiological alterations
- Correlate the metabolic alterations produced in heart failure and the influence that medical treatment has on them

### Module 2. Management of the Critical Patient with Acute Coronary Syndrome (ACS)

- Explain the recommendations collected in clinical practice guides in relation to the treatment of acute coronary syndrome
- Describe the pathophysiological and anatomical alterations in coronary circulation which leads to the appearance and clinical manifestation of ischemic heart disease
- Identify the possible complications in the context of acute coronary syndrome

### Module 3. Arrhythmias and Cardiac Pacing Devices: Diagnosis and Management in the Acute Phase

- Know the general basics of cardiac pacing devices
- Delve into cellular and cardiac electrophysiology, as well as in the anatomy and embryology of the conduction system
- Explain the expected and most common electrical disorders based on the patient profile and the underlying cardiac or extracardiac pathology

**Module 4. Non-Invasive Cardiac Imaging and Functional Tests**

- ♦ Describe the echocardiographic planes and the structures to look out for in each one of them
- ♦ Describe the types of tachycardia and their differential diagnosis based on the electrocardiogram characteristics findings
- ♦ Explain the hemodynamic calculations based on echocardiographic Doppler technology and their importance in the cardiovascular critical patient
- ♦ Identify acute complications in patients with acute myocardial infarction

**Module 5. Procedures and Techniques in a Patient in Cardiovascular Critical Care**

- ♦ Explain the indication of intubation, invasive and non-invasive mechanical ventilation in a critical cardiovascular patient
- ♦ Describe the hemodynamic and respiratory impact of each type of ventilation
- ♦ Identify the need for drainage in a pericardial effusion
- ♦ Know how balloon counterpulsation works and the indications and contraindications for its implantation

**Module 6. Special situations in the cardiovascular critical care patient**

- ♦ Define the possible complications and the natural evolution of the cardiac surgery patient
- ♦ Identify the key aspects in the treatment of myocarditis, pericarditis and pericardial effusion
- ♦ Explain the echocardiographic and hemodynamic alterations present in patients with indications of emergency surgery for acute valvular disease

**Module 7. Action Guides in Acute Heart Disease**

- ♦ Know the main protocols of action in acute cardiac pathology

**Module 8. Surgery, Anesthesia and Intensive Care in Heart Disease**

- ♦ Delve into the latest advances in ventricular assistance and transplantation
- ♦ Know the most innovative palliative and corrective surgical techniques in the field of in the field of Cardiovascular Critical Care in the ICU
- ♦ Address the management of pulmonary and renal complications derived from heart disease



*Enroll now and advance in your field of work with a comprehensive program that will allow you to put into practice everything you have learned”*

# 04 Skills

This Professional Master's Degree will allow you to acquire the theoretical and practical skills necessary and updated in the intervention in Gastroenterology and Cardiovascular Critical Care in the ICU Service. A very complete approach, in a high-level Hybrid Professional Master's Degree, which makes the difference.





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*This Hybrid Professional Master's Degree will allow you to learn the most effective techniques for the performance of transthoracic and transesophageal echocardiography"*



## General Skills

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- ♦ To increase their competence and performance in comprehensive medical care actions for hematological diseases and the health care of their patients in general, through the in-depth study of the epidemiological, preventive, clinical, pathophysiological, diagnostic, therapeutic and rehabilitative elements of these diseases
- ♦ Hone skills to manage, advise, or lead multidisciplinary teams to study blood cell and hematopoietic organ disorders and the medications used to treat them in communities or individual patients, as well as scientific research teams
- ♦ Develop skills for self-improvement, in addition to being able to provide training and professional improvement activities due to the high level of scientific and professional preparation acquired with this program
- ♦ Educate the population in the field of the prevention in order to acquire and develop a culture of prevention, based on healthy lifestyle choices





## Specific Skills

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- ♦ Master health determinants and their impact on morbidity and mortality rates of hematologic diseases
- ♦ Identify and analyze the latest scientific information on Cardiovascular Critical Care in the ICU Service, as well as associated diseases, in order to design plans and programs to control them
- ♦ Master different techniques of basic and automated hemacytometry, as well as hematological cytomorphology and cytochemistry
- ♦ Master the special techniques of flow cytometry, and basic techniques of molecular biology and cytogenetics applied to hematopoietic processes
- ♦ Diagnose these diseases in a timely manner from the clinical manifestations of patients in early stages to ensure proper treatment, rehabilitation, and control
- ♦ Support the importance of integrated clinical-diagnostic-therapeutic discussion with the participation of all specialists associated in the care of these patients as an important measure in institutional medical care to provide better comprehensive care for these patients
- ♦ Master the clinical, epidemiological, diagnostic, and therapeutic elements supported by the best scientific evidence available for these patients
- ♦ Identify the fundamental aspects of pharmacokinetics and pharmacodynamics for the use of drugs for these pathologies
- ♦ Halt the progression of drug misuse, based on reasoned therapeutics and supported by the best scientific evidence
- ♦ Correctly use and interpret all diagnostic and other resource studies in the care of your patients
- ♦ To master the indications, management and complications of patients undergoing allogeneic transplantation of hematopoietic progenitors from unrelated donor
- ♦ Advise pharmaceutical and biotechnology industry teams in the process of research and production of new drugs and alternative treatments for hematological diseases and hemotherapy
- ♦ Lead teams in health institutions, such as mortality review committee, quality of care, drug utilization
- ♦ Develop normative or referential documents such as clinical practice guidelines or policies for the care of these patients

05

# Course Management

TECH has assembled a full team of faculty with reputable expertise in the area of Cardiovascular Critical Care in the ICU Service. His excellent professional background is reflected in the syllabus of this program, as well as his human quality to resolve any questions that may arise about the content of the program.



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*You will have at your disposal an excellent team specialized in Cardiology, Electrophysiology and Arrhythmias”*

## International Guest Director

Alain Combes, M.D., a recognized **specialist** in **Intensive Care Medicine**, and an outstanding leader in the field of **critical care**, has an eminent career in the management of critically ill patients. As **Head of the ICU Department** at La Pitié-Salpêtrière Hospital, an integral part of the Paris Public Assistance Hospitals, he has led significant advances in the treatment of patients with **acute cardiac conditions** and **cardiac transplantation**.

His extensive **research** interests range from the care of the **critically ill cardiac patient**, including situations of **Cardiogenic Shock**, **Acute Myocardial Infarction** and **Complex Cardiac Surgery**. Likewise, his pioneering work in **Mechanical Circulatory Assistance** and **Extracorporeal Membrane Oxygenation** has positively impacted the treatment of **Severe Respiratory Failure**, excelling in rescue therapies such as **ECMO** and **ECCO<sub>2</sub>R**.

In fact, his active participation in technological advances also stands out. A great example is its collaboration with **Hemovent GmbH**, which has been crucial for the development of the world's most compact **Portable Extracorporeal Membrane Oxygenation System (ECMO)**. This revolutionary device not only offers unparalleled mobility, but also improves performance parameters compared to standard therapies. In this way, it has demonstrated its commitment to **medical innovation** and improved **care for patients** with cardiac and respiratory failure.

To this must be added the **solid international reputation** that Dr. Combes has forged as an opinion leader, being an active member of renowned medical organizations such as The Société de Réanimation de Langue Française (SRLF), The European Society of Intensive Care Medicine (ESICM), The American Thoracic Society (ATS), The European Society of Cardiology (ESC) and The Extra Corporeal Life Support Organization (ELSO). In addition, his expertise has been instrumental in publishing **cutting-edge research** in prestigious medical journals, consolidating his influence in the field.



## Dr. Combes, Alain

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- Specialist in Intensive Care Medicine
- Doctorate in Medicine and Philosophy
- Member of: The Société de Réanimation de Langue Française (SRLF), The European Society of Intensive Care Medicine (ESICM), The American Thoracic Society (ATS), The European Society of Cardiology (ESC), The Extra Corporeal Life Support Organization (ELSO), The International ECMO Network (ECMONet)

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

## Management

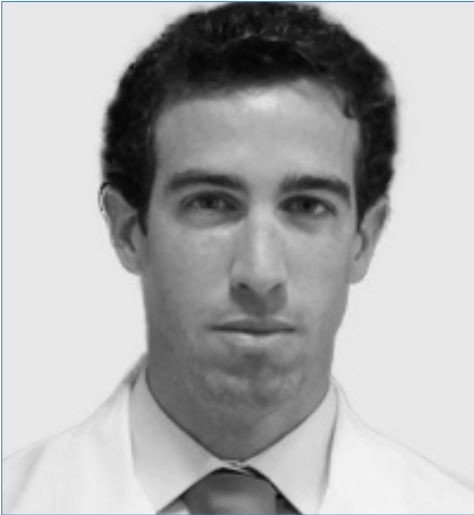


### Dr. Zamorano Gómez, José Luis

- ♦ Vice of the European Society of Cardiology
- ♦ Head of the Intensive Care Medicine Department, Ramón y Cajal Hospital
- ♦ Doctor of Medicine
- ♦ Executive Management and Health Resources Esade, Madrid
- ♦ National Qualification Professor of in Medicine
- ♦ Member of the First European Echocardiography Accreditation Committee of the European Association of Echocardiography
- ♦ Honorary Fellow American Society of Echocardiography
- ♦ Chairman of the Clinical Guidelines Committee of the European Society of Cardiology
- ♦ Chairman National Cardiovascular Panel FIS, Instituto Carlos III
- ♦ Associate Editor of the European Heart Journal Cardiovascular Imaging
- ♦ Author of more than 20 books, more than 500 articles in scientific journals and more than 400 communication in National and International Conferences
- ♦ Impact Factor > 1500. IH 84 and Citations > 40000
- ♦ Member of the Editorial Board of the Spanish Journal of Cardiology, Editorial Board of the European Journal of Echocardiography, Editorial Board of the American Society of Echocardiography, International Relations Task Force of the American Society of Echocardiography



## Management



### Dr. Rodríguez Muñoz, Daniel

- ♦ Cardiologist, Arrhythmologist and Interventional Electrophysiologist in La Zarzuela University Hospital
- ♦ Cardiologist, Arrhythmologist and Interventional Electrophysiologist at the 12 de Octubre Hospital
- ♦ Doctorate in Health Sciences, University of Alcalá
- ♦ Master's Degree in Pacemakers, Defibrillators and Aging from the University of Alcalá, Spain
- ♦ Master's Degree in Diagnostic and Therapeutic Cardiac Electrophysiology from CEU San Pablo University
- ♦ Level 2 accreditation for the practice of Interventional Electrophysiology
- ♦ Director and teaching collaborator of numerous courses and programs of postgraduate training in Arrhythmias
- ♦ Member of the European Heart Rhythmia Association (EHRA), Spanish Society of Cardiology (SEC), Section of Arrhythmias and Electrophysiology of the SEC

## Professors

### Dr. Castillo Orive, Miguel

- ♦ Faculty Area Specialist in Cardiology at the Ramón y Cajal Hospital
- ♦ Specialist in Cardiology at the San Francisco de Asís de Madrid Sanatorium
- ♦ Collaborator Professor of from Neurology University of Alcalá de Henares
- ♦ MIR Teacher
- ♦ PROMIR Scientific Director
- ♦ Author of books: PROMIR: Cardiology, The 10 most frequently asked topics in the MIR

### Dr. Sanmartín Fernández, Marcelo

- ♦ Head of Acute Coronary from Syndrome Section, Ramon and Cajal University Hospital,
- ♦ Cardiology Specialist
- ♦ Doctor of Medicine
- ♦ Degree in Medicine from the University of Rio de Janeiro of Janeiro
- ♦ Member of the Spanish Society of Cardiology

# 06

## Educational Plan

The syllabus of this Hybrid Professional Master's Degree has been developed by an excellent team of medical professionals, who have compiled in 8 modules, the most advanced knowledge on the techniques of diagnosis and treatment of patients in Cardiovascular Critical Care in the ICU For this purpose, TECH provides the most innovative pedagogical tools, which can be accessed 24 hours a day from any electronic device with an Internet connection.



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*Leading professionals in the area of Critical Care will provide you with the most relevant technological and scientific advances in this field"*

### **Module 1. Management of a Critical Patient with Heart Failure and Cardiogenic Shock**

- 1.1. Underlying Pathology in Heart Failure
  - 1.1.1. Structural Alterations
    - 1.1.1.1. From Anatomy to Echocardiography
  - 1.1.2. Physiological Alterations
    - 1.1.2.1. The Reason for Chronic Treatment and its Effect on Prognosis
- 1.2. Acute Pulmonary Edema
  - 1.2.1. Diagnostic and Prognostic Tools
  - 1.2.2. Acute Treatment and Adjustment of Chronic Treatment
- 1.3. Cardiogenic Shock
  - 1.3.1. Diagnostic and Prognostic Tools
    - 1.3.1.1. Differential Diagnosis of Shock
  - 1.3.2. Indication and Management of Vasoactive Drugs
  - 1.3.3. Indication and Management of Circulatory Assistances

### **Module 2. Management of the Critical Patient with Acute Coronary Syndrome (ACS)**

- 2.1. The Underlying Pathology in Acute Coronary Syndrome
  - 2.1.1. Structural Alterations
    - 2.1.1.1. Ischemic Heart Disease
  - 2.1.2. Acute Coronary Syndrome without Evidence of Coronary Lesions
    - 2.1.2.1. The Reason for Chronic Treatment and its Effect on Prognosis
- 2.2. Non-ST-Segment-Elevation in ACS
  - 2.2.1. Acute Management
    - 2.2.1.1. Diagnosis
    - 2.2.1.2. Treatment in the First 24 Hours
- 2.3. Expected Complications and Chronic Treatment in NSTEMACS
- 2.4. ST-Segment-Elevation ACS
  - 2.4.1. Acute Management
    - 2.4.1.1. Diagnosis
    - 2.4.1.2. Treatment in the First 24 Hours
  - 2.4.2. Expected Complications and Chronic Treatment

### **Module 3. Arrhythmias and Cardiac Pacing Devices: Diagnosis and Management in the Acute Phase**

- 3.1. General Bases: Cellular and Cardiac Electrophysiology Anatomy and Embryology of the Conduction System Normal and Pathological ECG
- 3.2. Canalopathies
- 3.3. Preexcitation Management

### **Module 4. Non-Invasive Cardiac Imaging and Functional Tests**

- 4.1. Basic Skills in Echocardiography
  - 4.1.1. Echocardiographic Planes
  - 4.1.2. Limitations in the Acute Context
  - 4.1.3. Hemodynamic Calculations
- 4.2. Special Situations
  - 4.2.1. Echocardiograms in the Initial Evaluation of the Patient
    - 4.2.1.1. The Patient in Shock and the Echocardiogram as a Diagnostic Tool
  - 4.2.2. Echocardiogram in the Hemodynamic Laboratory
  - 4.2.3. Echocardiogram in Cardiac Surgery Operating Room
  - 4.2.4. Acute Complications in Myocardio Infarction
- 4.3. General Basis of an Echocardiography Equipment
- 4.4. Transthoracic and Transesophageal Echocardiography
- 4.5. Cardiac CAT
- 4.6. Magnetic Resonance
- 4.7. Functional Tests

### **Module 5. Procedures and Techniques in a Patient in Cardiovascular Critical Care**

- 5.1. Intubation and Invasive Mechanical Ventilation
  - 5.1.1. Orotracheal Intubation
    - 5.1.1.1. Available Tools and Technique
  - 5.1.2. Mechanical Ventilation
    - 5.1.2.1. Forms of Ventilation
    - 5.1.2.2. Adjustment Depending on the Hemodynamic and Respiratory Situation of the Patient
- 5.2. Pericardiocentesis
  - 5.2.1. Indications
  - 5.2.2. Technique
  - 5.2.3. Alternatives to Pericardial Drainage

- 5.3. Arterial and Central Venous Cannulation
  - 5.3.1. Indications
  - 5.3.2. Technique
- 5.4. Counterpulsation Balloon
  - 5.4.1. Indications
  - 5.4.2. Implantation Technique
- 5.5. Transient Pacemaker
  - 5.5.1. Indications
  - 5.5.2. Implantation Technique

### Module 6. Special situations in the cardiovascular critical care patient

- 6.1. The Patient Before, During and After Cardiac Surgery
  - 6.1.1. Aspects to Look Out For
  - 6.1.2. Evolution
  - 6.1.3. Expected Complications
  - 6.1.4. Vascular Surgery Indications
  - 6.1.5. Emergency Coronary Surgery Indications
- 6.2. Acute Valvular Disease
  - 6.2.1. Endocarditis
  - 6.2.2. Other Indications of Emergency Surgery
- 6.3. Myocarditis
  - 6.3.1. Certainties and Controversies in Acute Management
- 6.4. Pericarditis, Pericardial Effusion and Cardiac Tamponade
  - 6.4.1. Acute and Chronic Treatment Options in Pericarditis

### Module 7. Action Guides in Acute Heart Disease

- 7.1. ST-Segment-Elevation ACS
- 7.2. Non-ST-Segment-Elevation ACS
- 7.3. Revascularization and DAPT
- 7.4. Heart Failure
- 7.5. Ventricular Arrhythmias and SCD - ICD Implantation Criteria
- 7.6. Syncope

### Module 8. Surgery, Anesthesia and Intensive Care in Heart Disease

- 8.1. Up-to-date Information on Congenital Cardiac Surgery
  - 8.1.1. Introduction and History of Congenital Heart Disease
  - 8.1.2. Basis of CEC and ECMO
  - 8.1.3. Ventricular and Transplant Care
- 8.2. Palliative and Corrective Surgical Techniques
  - 8.2.1. Surgical Techniques on Septal Defects and Rings
  - 8.2.2. IVC and ICA Partial Pulmonary Venous Anomalies
  - 8.2.3. AV Channel AP Window Cor Tiratium
  - 8.2.4. TAPVR Vascular Rings, DAP
  - 8.2.5. Right Heart Surgical Techniques
  - 8.2.6. TOF
  - 8.2.7. PAIVS and PAVSD
  - 8.2.8. Tricuspid Valve
  - 8.2.9. RVOT and Pulmonary Valve
  - 8.2.10. Left Heart Surgical Techniques
  - 8.2.11. Aortic Valve
  - 8.2.12. Mitral Valve and Coronary Anomalies
  - 8.2.13. Surgical Techniques of the Main Veins
  - 8.2.14. Aorta, Coarctation of the Aorta, IAA
  - 8.2.15. TGA and Truncus
  - 8.2.16. Single Ventricle Text and
- 8.3. Low Postoperative Expense Cardiac Dysfunction
- 8.4. Renal Complications Renal Purification Techniques
- 8.5. Pulmonary Complications Ventilatory Support Techniques Pulmonary Hypertension Crisis
- 8.6. Other Complications
  - 8.6.1. Post-Operation Infections Pneumonia, Sepsis and Infections of the Surgical Wound Mediastinitis
  - 8.6.2. Cardiac Tamponade Phrenic Plication and Others

07

# Clinical Internship

After completing the online training period, the program includes a practical training period in a reference clinical center. The medical professional will have at their disposal the support of a tutor who will accompany them throughout the process, both in the preparation and in the development of the clinical practices.





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*This Hybrid Professional Master's Degree offers you the opportunity to get up to date on the management of the critically ill patient with acute coronary syndrome (ACS)”*

The Internship Program's Internship Program consists of a 3-week clinical internship, Monday through Friday with 8 consecutive hours of practical training with an attending specialist. This stay will allow you to see real patients alongside a team of reference professionals applying the most innovative diagnostic procedures and planning the latest generation of therapy for each pathology.

An eminently practical proposal, where the professional will develop different activities focused on integrating the different procedures and protocols in their daily practice. You will be tutored by an excellent specialist, who will show you both the techniques and the state-of-the-art equipment used in the hospital center where the practical training will take place.

Undoubtedly, the professional is facing an excellent opportunity to be able to carry out a complete update of their knowledge in a 100% online health scenario and from the hand of the best medical professionals in the current clinical panorama.

The practical part will be carried out with the active participation of the student performing the activities and procedures of each area of competence (learning to learn and learning to do), with the accompaniment and guidance of the professors and other fellow trainees to facilitate teamwork and multidisciplinary integration as transversal competencies for Medicine practice (learning to be and learning to relate).

The procedures described below will form the basis of the practical part of the training, and their completion is subject to both the suitability of the patients and the availability of the center and its workload, with the proposed activities being as follows:





Module	Practical Activity
<b>Management of the critically ill patient with heart failure, cardiogenic shock Diagnose and treat heart failure and acute coronary syndrome (ACS)</b>	Diagnosing and treating acute pulmonary edema
	Participate in the management of patients with Cardiogenic Shock
	Perform diagnosis and treatment of non-ST-segment elevation ACS
	Recognize the expected complications and chronic treatment in NSTEMACS
	Perform diagnosis and treatment of ST-segment elevation ACS
<b>Arrhythmias and cardiac pacing devices: diagnosis and management in acute phase</b>	Diagnosis and treatment of Canalopathies
	Diagnosing and Treating Preexcitation
<b>Noninvasive cardiac imaging, functional testing and techniques in the cardiovascular critical care patient</b>	Implement the latest echocardiographic procedures
	Perform transthoracic and transesophageal echocardiography
	Perform and interpret cardiac CT or MRI
	Practice Intubation and invasive mechanical ventilation
	Perform pericardiocentesis and arterial and central venous cannulation
	Placement of counterpulsation balloon and placement of transient pacemaker

Module	Practical Activity
<b>Special situations in the cardiovascular critical care patient Analyze the patient before, during and after cardiac surgery</b>	Diagnose and treat acute valvular pathology
	Diagnosis and treatment of myocarditis
	Diagnose and treat pericarditis, pericardial effusion and cardiac tamponade
<b>Action Guides in Acute Heart Disease</b>	Address, diagnose and treat ACS-NSTEMACS and ACS-NSTEMI
	Practice Revascularization and DAPT
	Diagnosis and treatment of Ventricular Arrhythmias and SCD - Criteria for ICD implantation
	Diagnosing and treating syncope
<b>Surgery, anesthesia and intensive care in Congenital Cardiac Surgery</b>	Participate and support in the implementation of palliative and corrective surgical techniques

## Civil Liability Insurance

This institution's main concern is to guarantee the safety of the trainees and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this educational entity undertakes to take out civil liability insurance to cover any eventuality that may arise during the stay at the internship center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical training period. In this way, the professional will not have to worry in case he/she has to face an unexpected situation and will be covered until the end of the practical program at the center.



## General Conditions of the Internship Program

The general terms and conditions of the internship agreement for the program are as follows:

**1. TUTOR:** During the Hybrid Professional Master's Degree, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

**2. DURATION:** The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

**3. ABSENCE:** If the students does not show up on the start date of the Hybrid Professional Master's Degree, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

**4. CERTIFICATION:** Professionals who pass the Hybrid Professional Master's Degree will receive a certificate accrediting their stay at the center.

**5. EMPLOYMENT RELATIONSHIP:** The Hybrid Professional Master's Degree shall not constitute an employment relationship of any kind.

**6. PRIOR EDUCATION:** Some centers may require a certificate of prior education for the Hybrid Professional Master's Degree. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

**7. DOES NOT INCLUDE:** The Hybrid Professional Master's Degree will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed.

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

08

# Where Can I Do the Clinical Internship?

TECH always seeks to guarantee the excellence of its professionals, offering quality education within everyone's reach. For this reason, it has been decided to broaden the academic horizons so that this training can be given in a highly prestigious center. In this way, it becomes a unique opportunity to grow the professional's career.





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*Experience with TECH a unique way to to update your knowledge through practice in a prestigious hospital center”*



The student will be able to take the practical part of this Hybrid Professional Master's Degree in the following centers:



Medicine

### Hospital HM Modelo

Country	City
Spain	La Coruña

Address: Rúa Virrey Osorio, 30, 15011, A Coruña

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

**Related internship programs:**

- Anaesthesiology and Resuscitation
- Palliative Care



Medicine

### Hospital Maternidad HM Belén

Country	City
Spain	La Coruña

Address: R. Filantropía, 3, 15011, A Coruña

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

**Related internship programs:**

- Update in Assisted Reproduction
- Hospitals and Health Services Address



Medicine

### Hospital HM Nou Delfos

Country	City
Spain	Barcelona

Address: Avinguda de Vallcarca, 151, 08023 Barcelona

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

**Related internship programs:**

- Aesthetic Medicine
- Clinical Nutrition in Medicine



Medicine

### Hospital HM Madrid

Country	City
Spain	Madrid

Address: Pl. del Conde del Valle de Súchil, 16, 28015, Madrid

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

**Related internship programs:**

- Palliative Care
- Anaesthesiology and Resuscitation



Medicine

### Hospital HM Montepríncipe

Country	City
Spain	Madrid

Address: Av. de Montepríncipe, 25, 28660, Boadilla del Monte, Madrid

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

**Related internship programs:**

- Palliative Care
- Aesthetic Medicine



Medicine

### Hospital HM Torrelodones

Country	City
Spain	Madrid

Address: Av. Castillo Olivares, s/n, 28250, Torrelodones, Madrid

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

**Related internship programs:**

- Anaesthesiology and Resuscitation
- Palliative Care



Medicine

### Hospital HM Sanchinarro

Country	City
Spain	Madrid

Address: Calle de Oña, 10, 28050, Madrid

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

**Related internship programs:**

- Anaesthesiology and Resuscitation
- Palliative Care



Medicine

### Hospital HM Puerta del Sur

Country	City
Spain	Madrid

Address: Av. Carlos V, 70, 28938, Móstoles, Madrid

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

**Related internship programs:**

- Palliative Care
- Clinical Ophthalmology



### Clínica Yunes

Country	City
Argentina	Santiago del Estero

Address: Av. Libertad 626/640, G4200  
Santiago del Estero

Clinic specializing in cardiovascular care

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#### Related internship programs:

- Cardiovascular Critical Care in the ICU

09

# 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.





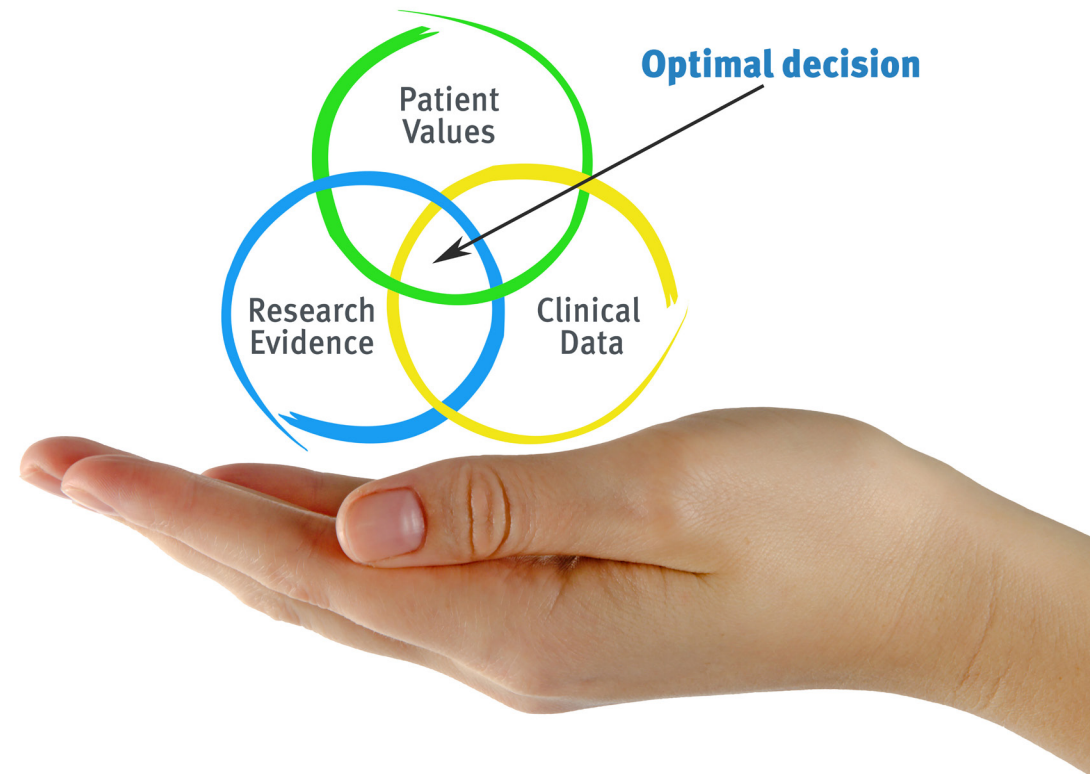
“

*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.

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

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

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



## Relearning Methodology

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

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

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



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

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

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

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

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



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



#### Study Material

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

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



#### Surgical Techniques and Procedures on Video

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



#### Interactive Summaries

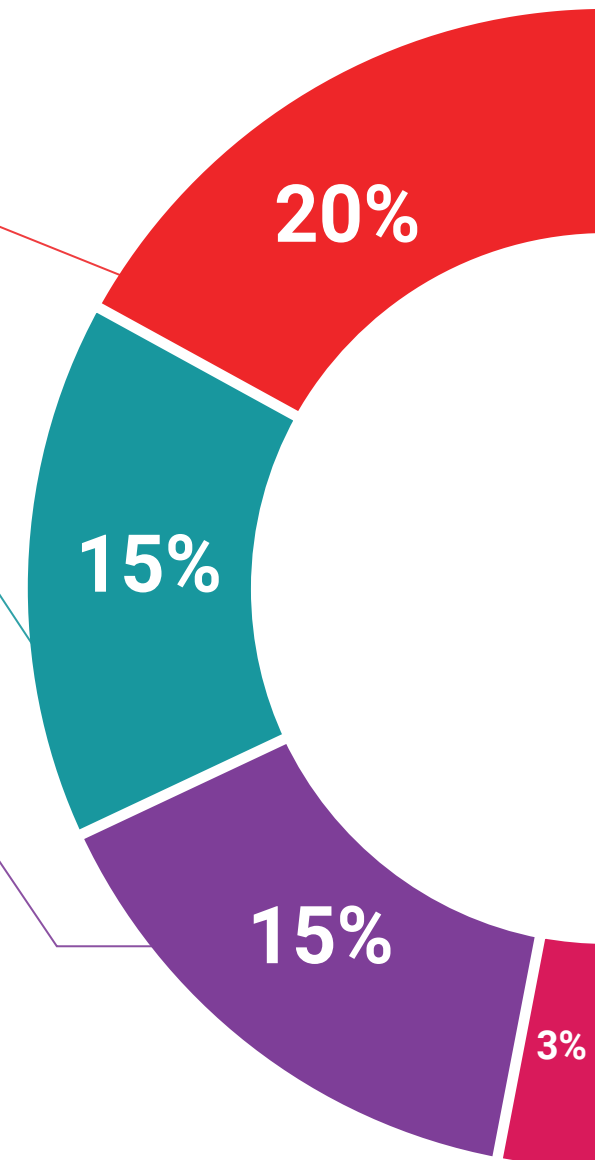
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

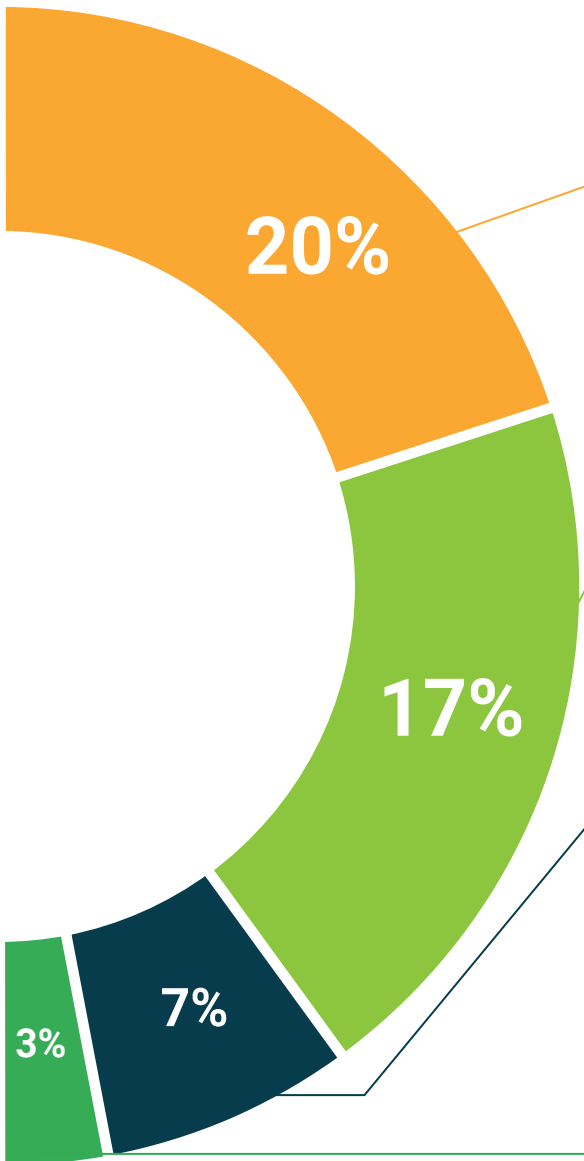
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Additional Reading

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





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

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



#### Testing & Retesting

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



#### Classes

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



#### Quick Action Guides

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



# 10 Certificate

The Hybrid Professional Master's Degree in Cardiovascular Critical Care in the ICU guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.





“

*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork”*

This **Hybrid Professional Master's Degree in Cardiovascular Critical Care in the ICU** contains the most complete and up-to-date program in the professional and academic landscape.

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

In addition to the diploma, students will be able to obtain an academic transcript, as well as a certificate outlining the contents of the program. In order to do so, students should contact their academic advisor, who will provide them with all the necessary information.

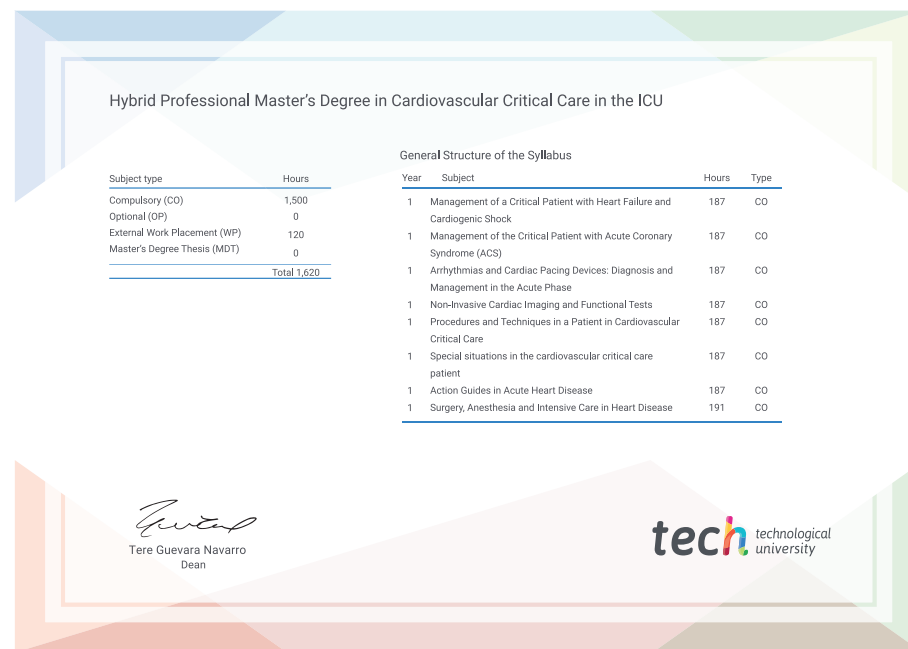
Title: **Hybrid Professional Master's Degree in Cardiovascular Critical Care in the ICU**

Course Modality: **Hybrid (Online + Clinical Internship)**

Duration: **12 months**

Certificate: **TECH Technological University**

Teaching Hours: **1,620 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 **tech** technological university

knowledge present quality

development online courses

virtual classro

**tech** technological university

**Hybrid Professional Master's Degree**  
Cardiovascular Critical Care in the ICU

Course Modality: Hybrid (Online + Clinical Internship)

Duration: 12 months

Certificate: TECH Technological University

Teaching Hours: 1,620 h.

# Hybrid Professional Master's Degree Cardiovascular Critical Care in the ICU

