Postgraduate Certificate

Ventilatory Mechanics

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Postgraduate Certificate

Ventilatory Mechanics

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Global University**
- Credits: **6 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/medicine/postgraduate-certificate/ventilatory-mechanics

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01

Introduction

In recent years, Non-Invasive Mechanical Ventilation has gained importance as a tool for treating patients with various respiratory diseases. To manage it and adjust its parameters properly, it is essential to have up-to-date knowledge about Ventilatory Mechanics to optimally adapt its configuration to each individual's needs. That is why TECH has developed this program, through which the specialist can delve into the latest scientific evidence regarding the relationship between ventilation and perfusion, or alterations in respiratory diseases, this way positioning themselves at the forefront of Medicine. All of this is made possible through a revolutionary 100% online methodology that allows for studying without being tied to inconvenient and rigid schedules.

Through this qualification, you will delve into the latest advancements in the relationship between ventilation and perfusion"

Ventilatory Mechanics is essential to rigorously identify abnormal breathing patterns and quickly detect potential pulmonary diseases in the patient. Similarly, it enables the adjustment of pressure and flow parameters of NIMV tools, as well as the selection of the most suitable interface for each individual, achieving fully effective ventilation for people with various respiratory conditions. Therefore, having extensive and up-to-date knowledge in this field is crucial for any pulmonologist aiming to practice cutting-edge medicine.

In this context, TECH has focused its efforts on creating this qualification, which provides the specialist with a comprehensive update in this field in just 180 hours of study. Through this academic experience, you will delve into the updated physiology of the respiratory system and techniques for interpreting spirometric values. Likewise, you will explore advanced methods to assess the patient's response to mechanical ventilation and therapeutic strategies to improve the ventilation-perfusion relationship.

Thanks to the online format of the Ventilatory Mechanics Diploma, health professionals can update their knowledge without the need for daily commutes to a study center. Furthermore, the program is designed and taught by specialists who have practiced as pulmonologists in leading international hospitals. This ensures the excellent quality of the educational content provided to students.

This **Postgraduate Certificate in Ventilatory Mechanics** contains the most complete and up-to-date scientific program on the market. The most important features include:

- The development of practical cases presented by specialists in Pulmonology
- 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

With this program, delve into the state-of-the-art mechanisms to evaluate the patient's response to mechanical ventilation"

Study and strengthen your knowledge at your own pace thanks to the Relearning system offered by TECH Global University"

Throughout this certificate, you will identify the sophisticated techniques to undertake the interpretation of spirometric values of each patient.

Get updated in Ventilatory Mechanics by the hand of reference specialists in the field of Pneumology.

The program's teaching staff includes professionals from the field who contribute their work experience to this educational 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 education programmed to learn 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 during the academic year For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.

02

Objectives

This Postgraduate Certificate has been designed to ensure an optimal update for pulmonologists in Ventilatory Mechanics in just 180 hours of intensive study. Through this academic experience.

Adopt in your daily practice the most updated knowledge on Non-Invasive Mechanical"

General Objectives

- Understand the importance and role of Non-Invasive Mechanical Ventilation in the treatment of acute and chronic respiratory pathologies
- Acquire knowledge of the updated indications and contraindications for the use of Non-Invasive Mechanical Ventilation, as well as the different types of devices and ventilation modes
- Develop skills and competencies in monitoring patients with Non-Invasive Mechanical Ventilation, including data interpretation and the detection and prevention of complications
- Explore cutting-edge technologies used in the telemonitoring of patients with Non-Invasive Mechanical Ventilation and the ethical and legal aspects related to its use
- Delve into the key differences in Non-Invasive Mechanical Ventilation in Pediatrics
- Delve your understanding of the ethical aspects related to the management of patients requiring NIV

Get up to date in Ventilatory Mechanics through state-of-the-art didactic support such as simulation of real cases or explanatory video"

Specific Objectives

- Gain in-depth knowledge of respiratory control mechanisms and blood pH regulation, as well as ventilatory responses in situations of hypoxia, hypercapnia, and acidosis, and the interaction between the respiratory system and the central nervous system
- Delve into the forces acting on the lungs during ventilation and the relationship between respiratory mechanics and respiratory muscle effort
- Explore different lung volumes and capacities, their alterations in respiratory diseases, and the interpretation of spirometric values and their limitations
- Understand the concept of compliance and resistance of the respiratory system, including measurement and influencing factors, as well as alterations in respiratory diseases
- Deepen your understanding of ventilation-perfusion relationships, advanced methods for detecting abnormalities in respiratory diseases, and therapeutic strategies to improve these relationships

03

Course Management

Motivated by TECH's unwavering commitment to building top-notch programs, this program features a faculty composed of the best specialists in Pulmonology who are actively working in cutting-edge hospitals. These physicians are responsible for creating the didactic resources for this Postgraduate Certificate. Therefore, the content on Ventilatory Mechanics provided to the students will be in line with the latest advancements in the field.

Complete a top-notch medical update alongside specialists who have worked in the most cutting-edge hospitals in Spain"

International Guest Director

With a relevant trajectory in the field of Pulmonology and Clinical Research, Dr. Maxime Patout distinguishes himself as an internationally renowned physician and scientist. As such, his involvement and contribution have led him to position himself as Clinical Director in Public Assistance in prestigious hospitals in Paris, standing out for his leadership in the management of Complex Respiratory Diseases. With this, it is worth mentioning his work as Coordinator of the Department of Functional Explorations of Breathing, Exercise and Dyspnea at the famous Hospital de la Pitié-Salpêtrière.

In the field of Clinical Research, Dr. Patout has made valuable contributions in leading areas such as Chronic Obstructive Pulmonary Disease, Lung Cancer and Respiratory Physiology. Accordingly, in his role as a Research Fellow at Guy's and St Thomas' NHS Foundation Trust, he has conducted groundbreaking studies that have expanded and improved the treatment options available to patients.

In this line, his versatility and leadership as a physician give him a vast experience in fields such as Biology, Physiology and Pharmacology of Circulation and Respiration. Therefore, he stands out as a renowned specialist in the Pulmonary and Systemic Diseases unit. In addition, his recognized competence in the Anti-Infectious Chemotherapy unit also places him as an outstanding reference in the field, being a regular advisor to future health professionals.

For all these reasons, his outstanding expertise in the field of Pulmonology has led him to be an active member of prestigious international organizations such as the European Respiratory Society and the French-Language Society of Pneumology, where he continues to contribute to scientific progress. So much so, that he shows an active participation in symposiums that enhance his medical excellence and constant updating in his field.

Dr. Patout, Maxime

- Clinical Director in Public Care at the Salpêtrière Hospital, Paris, France
- Clinical Research Fellow at Guy's and St Thomas' NHS Foundation Trust
- Coordinator of the Breathing, Exercise and Dyspnea Functional Examination
- Service at the Pitié-Salpêtrière Hospital
- Doctor of Medicine, University of Rouen
- Master's Degree in Biology, Physiology and Pharmacology of the Circulation and Respiration at the University of Paris
- University Expert in Pulmonary and Systemic Diseases from the University of Lille
- University Expert in Anti-infectious Chemotherapy, University of Rouen
- Medical Specialist in Pulmonology from the University of Rouen
- Member of: European Respiratory Society, French-language Society of Pneumology

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

Management

Dr. Landete Rodríguez, Pedro

- Co-coordinator of the Basic Ventilation Department at La Princesa University Hospital
- Pulmonologist at La Princesa University Hospital
- Pulmonologist at Blue Healthcare
- Researcher in several research groups
- Professor in undergraduate and postgraduate university studies
- Author of numerous scientific publications in international journals and participant in several book chapters
- Speaker at international medical congresses
- Doctor Cum Laude by the Autonomous University of Madrid

Professors

Dr. Corral Blanco, Marta

- Pulmonology Specialist and Researcher
- Pulmonologist at the Hospital Universitario 12 de Octubre
- Author of numerous scientific articles and several book chapters
- Speaker at numerous Pulmonology Congresses
- Course on Comprehensive Care for Chronic Obstructive Pulmonary Disease by the Complutense University of Madrid

Make the most of this opportunity to learn about the latest advances in this field in order to apply it to your daily practice"

04

Structure and Content

The syllabus of this program has been rigorously developed with the aim of providing the specialist with the most cutting-edge and up-to-date knowledge on Ventilatory Mechanics. Each topic in the Postgraduate Certificate is accompanied by a wide range of highly diverse textual and multimedia educational materials, allowing the student to choose those that best suit their academic needs. Furthermore, the 100% online mode enables them to study from wherever they prefer, 24 hours a day.

The 100% online modality offered by this program allows you to update yourself from the comfort your own home"

Module 1. Ventilatory Mechanics

1.1. Anatomy and Physiology of the Respiratory System
- 1.1.1. Structure and function of the lungs and their relationship to the rib cage
- 1.1.2. Mechanics of Pulmonary Ventilation
- 1.1.3. Gas exchange at the alveolar level

1.2. Ventilation Control and pH Regulation
- 1.2.1. Respiratory Control Mechanisms (chemoreceptors, baroreceptors, etc.)
- 1.2.2. Regulation of Blood pH and Its Relationship to Ventilation
- 1.2.3. Ventilatory Responses in Hypoxia, Hypercapnia, and Acidosis
- 1.2.4. Interaction between the Respiratory System and the Central Nervous System

1.3. Transpulmonary Pressure and Respiratory Mechanics
- 1.3.1. Forces Acting on the Lungs During Ventilation (atmospheric pressure, intrapleural pressure, etc.)
- 1.3.2. Lung Protective Mechanisms Against Overdistension and Collapse
- 1.3.3. Respiratory Mechanics in Pathological Conditions (emphysema, pulmonary fibrosis, etc.)
- 1.3.4. Relationship between Respiratory Mechanics and Respiratory Muscle Effort

1.4. Tidal Volume, Minute Volume, and Vital Capacity
- 1.4.1. Definition and Measurement of Different Lung Volumes and Capacities
- 1.4.2. Alterations in Lung Volumes and Capacities in Respiratory Diseases
- 1.4.3. Interpretation of Spirometric Values and Their Limitations

1.5. Compliance and Resistance of the Respiratory System
- 1.5.1 Concept
- 1.5.2 Measurement
- 1.5.3. Influencing Factors
- 1.5.4. Alterations in Respiratory Diseases

1.6. Types of Breathing (Spontaneous, Assisted, and Controlled)
- 1.6.1. Definition and Characteristics of Different Types of Breathing
- 1.6.2. Assessment of Patient Response to Mechanical Ventilation

1.7. Ventilation-perfusion ratio
- 1.7.1. Definition and Physiology of Ventilation-Perfusion Ratio
- 1.7.2. Alterations in Ventilation-Perfusion Ratio in Respiratory Diseases
- 1.7.3. Methods for Evaluating Ventilation-Perfusion Ratio
- 1.7.4. Therapeutic Strategies to Improve Ventilation-Perfusion Ratio

1.8. Oxygenation and Gas Transport
- 1.8.1. Alterations in Oxygenation and Gas Transport in Respiratory Diseases
- 1.8.2. Assessment in Oxygenation and Gas Transport in clinical practice
- 1.8.3. Treatment of Hypoxemia and Hypercapnia in Respiratory Patients
- 1.8.4. Complications of Hypoxemia and Hypercapnia Treatment

1.9. Effects of Mechanical Ventilation on Respiratory Physiology
- 1.9.1. Physiology of Mechanical Ventilation

1.10. Changes in Ventilatory Mechanics During Non-Invasive Mechanical Ventilation
- 1.10.1. Lung Injuries Associated with Mechanical Ventilation
- 1.10.2. Optimizing Mechanical Ventilation to Improve Respiratory Physiology

Enroll in the Postgraduate Certificate in Ventilatory Mechanics and study choosing those didactic formats that best suit your learning needs"

05

Methodology

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

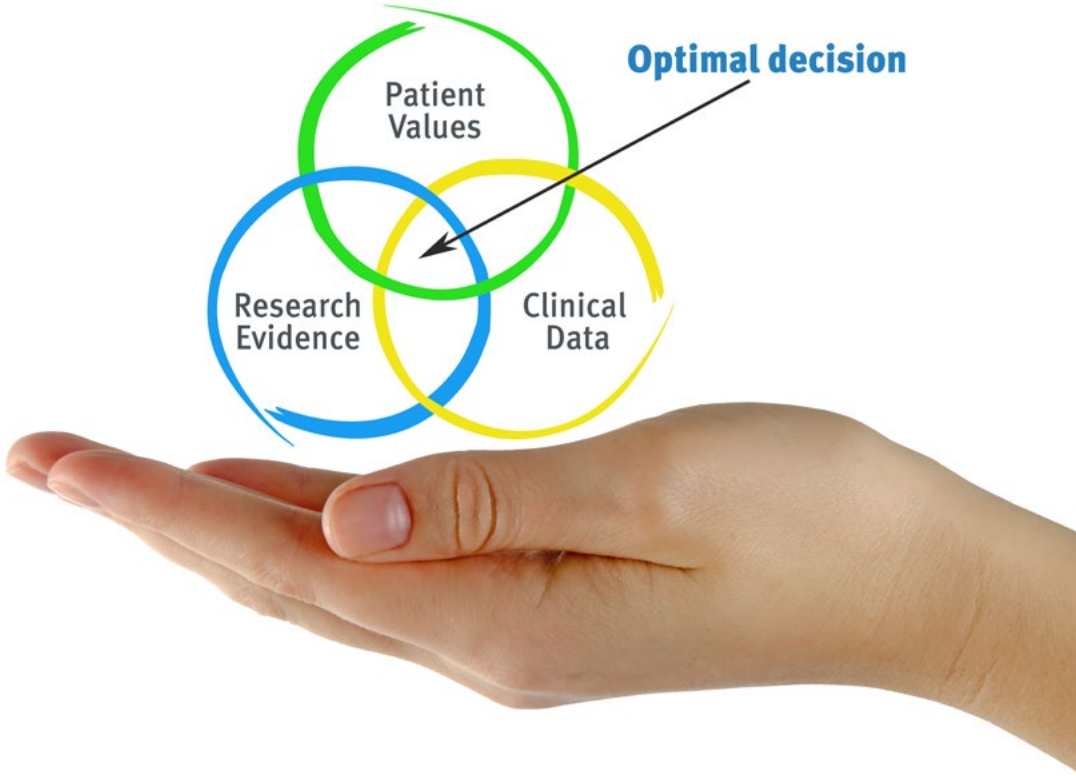
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

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

At TECH 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:

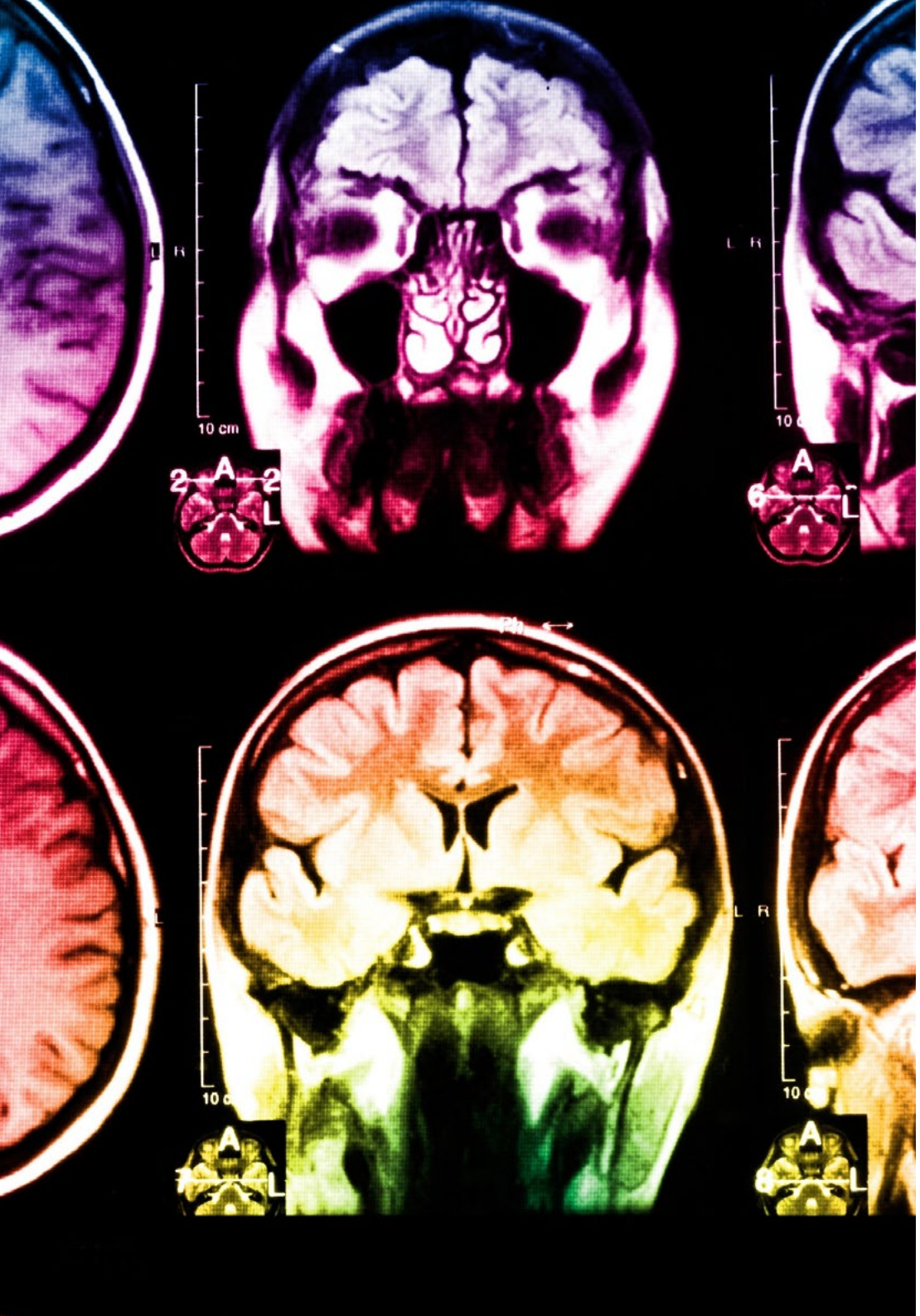
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better 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.

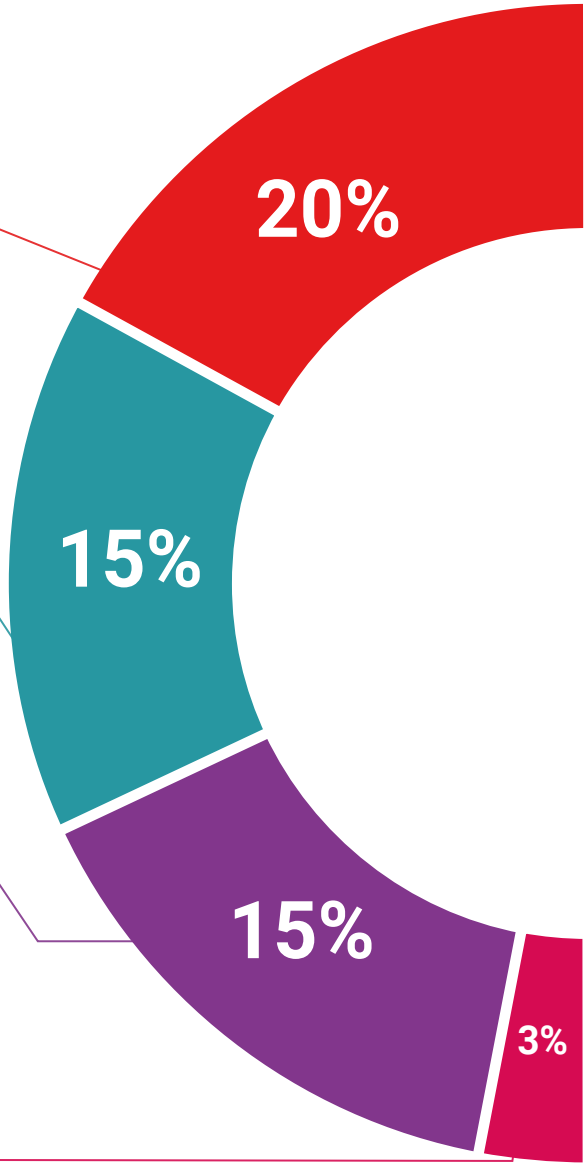
Interactive Summaries

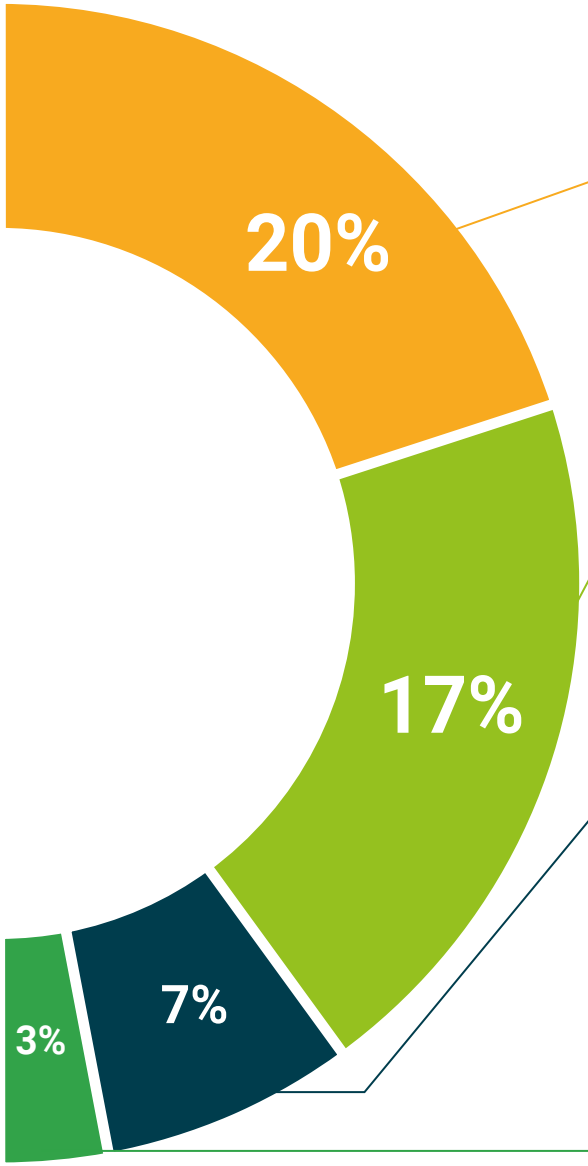
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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.

06

Certificate

The Postgraduate Certificate in Ventilatory Mechanics guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

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

This program will allow you to obtain your **Postgraduate Certificate in Ventilatory Mechanics** 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** title 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: **Postgraduate Certificate in Ventilatory Mechanics**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

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

Postgraduate Certificate in Ventilatory Mechanics

This is a program of 180 hours of duration equivalent to 6 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
Rector

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

*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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Postgraduate Certificate

Ventilatory Mechanics

- Modality: **online**
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- Exams: **online**

Postgraduate Certificate
Ventilatory Mechanics

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