

Postgraduate Certificate

Advances in Mechanical Ventilation



Postgraduate Certificate Advances in Mechanical Ventilation

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

Website: www.techtute.com/us/medicine/postgraduate-certificate/advances-mechanical-ventilation

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01

Introduction

The high hospital mortality rate associated with respiratory failure requires specialized personnel with extensive knowledge and management of this pathology, since it is also one of the most frequent. The most recent advances in Mechanical Ventilation have enabled a new unparalleled landscape for treating these conditions, so specialists must keep themselves up to date in the field to know the latest technologies and developments at their disposal. This TECH program delves precisely into this issue, with topics devoted to conventional oxygen therapy, non-invasive mechanical ventilation and high-flow therapies with nasal cannulas.



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*Discover the latest advances in
Mechanical Ventilation in the wake of
the Coronavirus pandemic”*

Current developments and research regarding all types of respiratory conditions have triggered advances in mechanical ventilation, especially given the recency of the coronavirus pandemic.

Within this framework of action, specialists must have the highest level of training to deal with the most complex respiratory conditions in a current and up-to-date manner. In addition to delving into technological developments, the program provides specialists with the most vigorous discoveries in the pathophysiology of respiratory insufficiencies, as well as clinical diagnosis and prevailing imaging tests.

Therefore, students will find in this program the most cutting-edge research on the indications and contraindications of non-invasive mechanical ventilation, as well as the latest clinical applications of high-flow nasal cannula therapy. This course is therefore an excellent opportunity to acquire up-to-date specialized knowledge on the subject matter.

Moreover, TECH knows how complicated it can be to balance this kind of academic activity with professional and personal responsibilities. For this reason, TECH offers the program in an innovative, completely online format. Specialists will have access to all the educational material from the first day, allowing them to download it and study it at their own pace and convenience.

This **Postgraduate Certificate in Advances in Mechanical Ventilation** contains the most complete and up-to-date academic program on the market. Its most notable features are:

- ♦ Practical cases presented by experts 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 the self-assessment process can be carried out to improve learning
- ♦ Special emphasis is placed on innovative methodologies in the approach to respiratory insufficiencies
- ♦ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ♦ Access to content from any fixed or portable device with an Internet connection



This program will provide you with the most up-to-date and comprehensive knowledge you are looking for to update on the latest Advances in Mechanical Ventilation"

“*Don't sacrifice your personal or professional life on other programs that can't be adapted to your needs”
At TECH, you decide how to take on the entire course load, wherever and whenever it best suits you”*

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

Incorporate into your daily practice the most modern approach to the most frequent respiratory failure in any area of Pulmonology.

Get up to date with the most modern ventilation mode, including NAVA, IVAPS and AVAPS.



02 Objectives

The program objective is to provide professionals with the most updated knowledge in everything related to Mechanical Ventilation, including topics that address current research on respiratory failure. The purpose is to update specialists on the most urgent pulmonological topics and issues, especially in the wake of the coronavirus pandemic.





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You will have at your disposal a whole team of professionals ready to offer you the best possible personalized support and guidance”



General Objective

- ◆ Provide an update on the latest scientific evidence available in published guidelines, scientific articles and systematic reviews
- ◆ Address the fundamental aspects in treating pulmonary pathologies
- ◆ Update knowledge of the most frequent pathologies in Pulmonology

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You will learn the latest developments in monitoring patients being treated with Non-Invasive Ventilation, and the procedures to follow in special emergency situations”





Specific Objectives

- ◆ Understand the pathophysiology and classification of respiratory failure and learn the keys to diagnosis for clinical practice
- ◆ Provide knowledge based on the best available evidence on the different treatment options for respiratory failure, including the application and contraindications of both NIV and HFO in acute and chronic respiratory failure
- ◆ Delve deeper into the main ventilatory modalities and asynchronies during NIMV
- ◆ Delve into the main features and clinical benefits of high-flow oxygen therapy

03

Course Management

This Postgraduate Certificate is directed by a highly prestigious teaching team in the area of Pulmonology. Their experience at the head of this department in renowned hospitals gives a special character to the syllabus, since specialists will deal with real case studies that contextualize all the theory taught. This is a quality guarantee for the entire syllabus and, consequently, the entire program.





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You will be supported by professionals who know your updating needs, providing you with all the possible materials to do so”

International Guest Director

Dr. Franck Rahaghi is one of the most prolific international figures in the field of **Pneumology**. Noted for his leadership in quality and medical care, as well derived his commitment to clinical research, he has held several important positions at Cleveland Clinic, Florida. Notable among them are his roles as **Chairman of Quality, Medical Director of the Department of Respiratory Care and Director of the Pulmonary Hypertension Clinic**.

Thanks to his studies and continuous preparation in this discipline, he has made several contributions in the **rehabilitation of patients with various respiratory pathologies**. These contributions and permanent academic improvement have allowed him to assume other responsibilities such as the position of **Head of the Department of Pulmonary Education and Rehabilitation**. In addition, he is a member of the Internal Review Committee, responsible for **supervising the correct execution of research and clinical trials** (Activated Protein C and IFN gamma-1b) inside and outside the aforementioned health institution.

In his solid preparation, he has established care links with centers of excellence such as the **Rockefeller University Hospital in New York**, as well as the Internal Medicine programs at the **University of Illinois at Chicago and the University of Minnesota**. He also studied at the **Department of Interventional Pulmonary Pulmonology and Pulmonary Hypertension at the University of California-San Diego**. He has also participated in important academic projects as an instructor in Genetic Medicine.

Dr. Rahaghi has authored and co-authored numerous articles published in renowned scientific journals in the medical field. Among the most recent and significant studies he has unveiled are his researches on the **impact of COVID-19 on the respiratory health of patients**, specifically on its effects in **controlling Pulmonary Hypertension**.

His other fields of interest include **Scleroderma, Sarcoidosis AATD and ILD/IPF**. He is also a consulting member of MedEdCenter Incorporated, a non-profit corporation dedicated to **providing educational materials focused on pulmonary pathologies**. An initiative from where he is committed to promote the education of patients and physicians through new technologies.



Dr. Rahaghi, Franck

- Medical Director, Department of Respiratory Care, Cleveland Clinic Hospital, Florida, USA
- Director of the Pulmonary Hypertension Clinic attached to the
- Cleveland Clinic Hospital, Florida, USA.
- Bachelor of Science (BS), Bioengineering and Biomedical Engineering from the University of San Diego.
- Master's Degree in Health Sciences/Administration at UC Berkeley

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

Management



Dr. Jara Chinarro, Beatriz

- ♦ Acting Chief of the Pulmonology Service Puerta de Hierro University Hospital
- ♦ Degree in Medicine and Surgery, Complutense University Madrid
- ♦ MIR Pulmonary Specialist
- ♦ Specialist in sleep disorders, CEAMS



Dr. Ussetti Gil, Piedad

- ♦ Emeritus Advisor in the Pulmonology Department, Puerta de Hierro University Hospital, Majadahonda
- ♦ Degree in Medicine and Surgery, Central University of Barcelona
- ♦ Specialist in Pulmonology
- ♦ Executive Master's Degree in Healthcare Leadership ESADE
- ♦ Honorary Professor in the Medicine Department, Autonomous University of Madrid



Professors

Dr. Izquierdo Pérez, Ainhoa

- ◆ Specialist Physician in Pulmonology, Puerta De Hierro University Hospital
- ◆ Degree in Medicine, University of Alcalá de Henares
- ◆ Master's Degree in Clinical Medicine UCJC, Camilo José Cela University
- ◆ Master's Degree in EPID, Catholic University of Murcia

Dr. Zambrano Chacón, María de los Ángeles

- ◆ Resident Intern, Pneumology Department, Jiménez Díaz Foundation University Hospital
- ◆ Degree in Medicine, Central University of Venezuela
- ◆ Master's Degree in Infectious Diseases and Antimicrobial Treatment from CEU Cardenal Herrera University
- ◆ Workshop on Pneumological Emergencies, Jiménez Díaz Foundation

04

Structure and Content

The structure and contents of this program respond to the most innovative pedagogical methodology in the academic world, since TECH uses the best educational technology available to develop its programs. Thanks to *Relearning*, specialists will update all their knowledge in a natural and progressive way, without requiring a great effort or an excessive investment of study time.





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You will gain access to a program full of practical aids, teaching guides and interactive summaries that will help you in studying the contents”

Module 1. Respiratory Failure: Non-Invasive Mechanical Ventilation High-Flow Oxygen Therapy

- 1.1. Respiratory Failure
 - 1.1.1. Pathophysiology-Specific (Partial, Global, Postoperative or Hypoperfusion / Shock)
 - 1.1.1.1. Onset-Time-Specific (Acute, Chronic and Accutely Chronic)
 - 1.1.1.2. Alveolar-Arterial Gradient-Specific (Normal or Elevated)
 - 1.1.1.3. Pathophysiological Mechanisms
 - 1.1.2. Oxygen Partial Pressure Decrease
 - 1.1.2.1. Shunt Presence
 - 1.1.2.2. Ventilation/Perfusion Imbalance (V/Q)
 - 1.1.2.3. Alveolar Hypoventilation
 - 1.1.2.4. Diffusion Alteration
- 1.2. Diagnosis
 - 1.2.1. Clinical symptoms
 - 1.2.2. Arterial Blood Gas Analysis Interpretation
 - 1.2.3. Pulse Oximetry
 - 1.2.4. Imaging Tests
 - 1.2.5. Others: Respiratory Function Tests, ECG, Blood Work, etc.
 - 1.2.6. Respiratory Failure Etiology
 - 1.2.7. Respiratory Failure Treatment
 - 1.2.7.1. General Measures
 - 1.2.7.2. Oxygen Therapy, NIV and HFO (See Subsequent Sections)
- 1.3. Conventional Oxygen Therapy
 - 1.3.1. Acute Oxygen Therapy Indications
 - 1.3.2. Chronic Home Oxygen Therapy Indications
 - 1.3.3. Administrative Systems and Sources
 - 1.3.4. Oxygen Sources
 - 1.3.5. Special Situations: Flying
- 1.4. Non-Invasive Mechanical Ventilation (NIMV)
 - 1.4.1. Physiopathological Effects
 - 1.4.1.1. On the Respiratory System
 - 1.4.1.2. On the Cardiovascular System
 - 1.4.2. Components
 - 1.4.2.1. Interfaces
 - 1.4.2.2. Interphase Complications: Skin Lesions, Leaks, etc.
 - 1.4.2.3. Accessories
 - 1.4.3. Monitoring
- 1.5. Indications and Contraindications for NIMV
 - 1.5.1. Acute Phase
 - 1.5.1.1. Urgent Situations prior to Diagnostic Certainty
 - 1.5.1.2. Acute Hypercapnic Respiratory Failure (Acute COPD, OHS Patient Decompensation, Respiratory Center Depression, etc.)
 - 1.5.1.3. De Novo Hypoxemic ARF / ARDS / Immuno-Compromised
 - 1.5.1.4. Neuromuscular Diseases
 - 1.5.1.5. Postoperative Care
 - 1.5.1.6. Weaning and Extubation
 - 1.5.1.7. Patients Ordered Not to Intubate
 - 1.5.2. Chronic Phase
 - 1.5.2.1. COPD
 - 1.5.2.2. Restrictive Diseases (Chest Wall, Diaphragm, Neuromuscular, etc.)
 - 1.5.2.3. Palliative Care
 - 1.5.3. Contraindications
 - 1.5.4. NIMV Failure
- 1.6. Basic Concepts of NIMV
 - 1.6.1. Ventilator Respiratory Parameters
 - 1.6.1.1. Trigger
 - 1.6.1.2. Cycles
 - 1.6.1.3. Slope
 - 1.6.1.4. Inspiratory Positive Airway Pressure (IPAP)
 - 1.6.1.5. Expiratory Positive Airway Pressure (EPAP)
 - 1.6.1.6. Pressure Support
 - 1.6.1.7. Positive End-Expiratory Pressure (PEEP)
 - 1.6.1.8. Inspiration / Expiration (I/E) Ratio
 - 1.6.2. Respiratory Curves Interpretation

- 1.7. Predominant Ventilation Modalities
 - 1.7.1. Pressure Limits
 - 1.7.1.1. Continuous Positive Airway Pressure (CPAP)
 - 1.7.1.2. Bilevel Positive Airway Pressure (BiPAP)
 - 1.7.2. Volume Limits
 - 1.7.3. New Modalities: AVAPS, IVAPS, NAVA, Autotrack
- 1.8. Main Asynchronies
 - 1.8.1. Leakage-Induced
 - 1.8.1.1. Self-Cycling
 - 1.8.1.2. Prolonged Inspiration
 - 1.8.2. Ventilator-Induced
 - 1.8.2.1. Short Cycle
 - 1.8.2.2. Double Trigger
 - 1.8.2.3. Ineffective Effort
 - 1.8.3. Patient-Induced
 - 1.8.3.1. AutoPEEP
 - 1.8.3.2. Reverse Trigger
- 1.9. High-Flow Nasal Cannula Therapy (HFNCT)
 - 1.9.1. Components
 - 1.9.2. Clinical Effects and Action Mechanisms
 - 1.9.2.1. Oxygenation Improvement
 - 1.9.2.2. Dead Space Flushing
 - 1.9.2.3. PEEP Effect
 - 1.9.2.4. Decreased Respiratory Work
 - 1.9.2.5. Hemodynamic Effects
 - 1.9.2.6. Comfort
- 1.10. Clinical Applications and Contraindications for Tenofovir Alafenamide (TAF)
 - 1.10.1. Clinical Applications
 - 1.10.1.1. Acute Hypoxemic Respiratory Failure / ARDS / Immunocompromised
 - 1.10.1.2. Hypercapnic Respiratory Failure in COPD
 - 1.10.1.3. Acute Heart Failure and Acute Pulmonary Edema
 - 1.10.1.4. Surgical Setting: Invasive (Fibrobronchoscopy) and Postoperative Procedures
 - 1.10.1.5. Pre-Oxygenation before Intubation and Post-Extubation Respiratory Failure Prevention
 - 1.10.1.6. Palliative Patients
 - 1.10.2. Contraindications
 - 1.10.3. Complications



Thanks to TECH's use of the best pedagogical methodology, the course load is much more manageable, allowing you to pass the Postgraduate Certificate without setbacks"

05 Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.



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TECH will prepare you to face new challenges in uncertain environments and achieve success in your career”

The student: the priority of all TECH programs

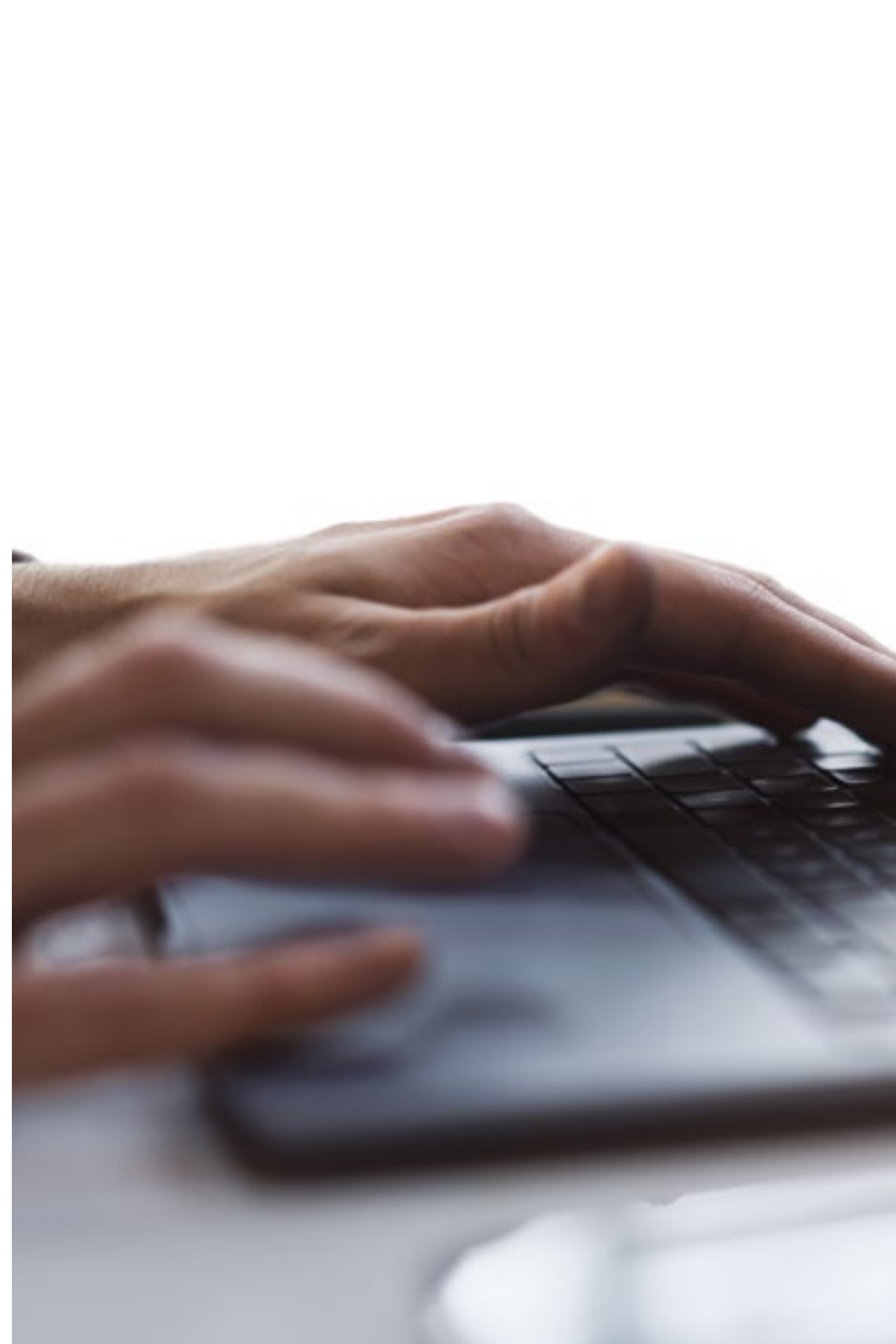
In TECH's study methodology, the student is the main protagonist.

The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

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*At TECH you will NOT have live classes
(which you might not be able to attend)”*



The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

“*TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want*”

Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

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.



A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.



The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule”

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 assess 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.

The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the teaching quality, the quality of the materials, the structure of the program and its objectives is excellent. Not surprisingly, the institution became the top-rated university by its students according to the global score index, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.



As such, the best educational materials, thoroughly prepared, will be available in this program:



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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



Interactive Summaries

We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

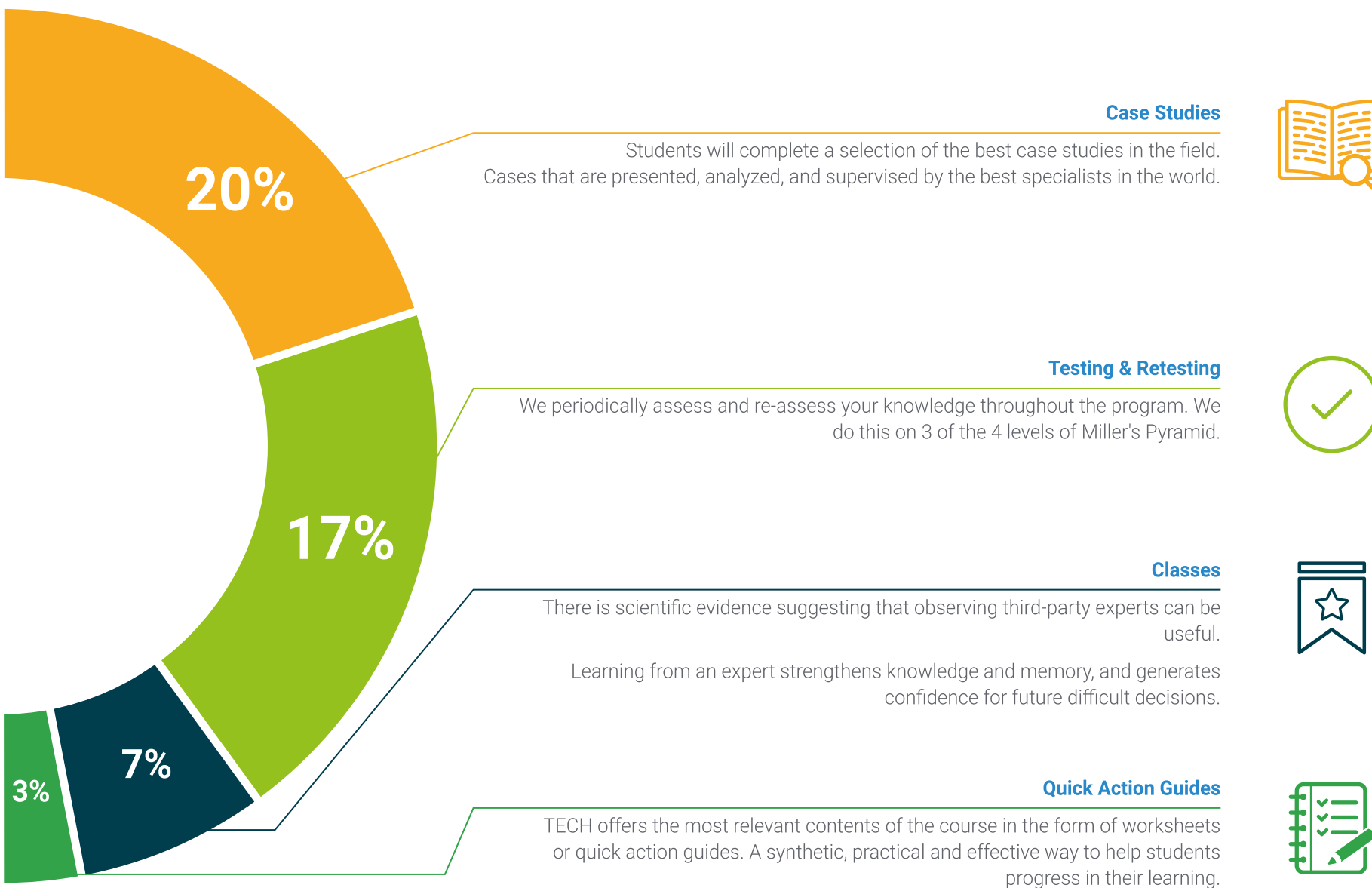
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.





06 Certificate

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



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

This private qualification will allow you to obtain a **Postgraduate Certificate in Advances in Mechanical Ventilation** 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: **Postgraduate Certificate in Advances in Mechanical Ventilation**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



future
health confidence people
education information tutors
guarantee accreditation teaching
institutions technology learning
community commitment
personalized service innovation
knowledge present
online training
development languages
virtual classroom



Postgraduate Certificate Advances in Mechanical Ventilation

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

Advances in Mechanical Ventilation

