

# Master's Degree

## Hyperbaric Medicine in Physical Activity and Sport

Endorsed by the NBA





## Master's Degree Hyperbaric Medicine in Physical Activity and Sport

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

Website: [www.techtute.com/us/sports-science/master-degree/master-hyperbaric-medicine-physical-activity-sport](http://www.techtute.com/us/sports-science/master-degree/master-hyperbaric-medicine-physical-activity-sport)

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# 01

# Introduction to the Program

Athletes, and Sports Medicine by extension, have found in Hyperbaric Treatment a therapeutic intervention that combines efficiency and simplicity, resulting in highly successful outcomes. Furthermore, an increasing number of athletes are turning to Hyperbaric Medicine as an adjunctive factor in healing their physical injuries, making the training of professionals in Sports Sciences in this field crucial. It will enable them to provide high-quality care through the benefits offered by this medical practice. In this regard, this university program will provide an in-depth approach to the use of Hyperbaric Medicine as a means of addressing injuries caused by physical activity and sport. As a result, professionals in this field will be better prepared to utilize it and, therefore, more competent within the sector. As a result, the professional in this field will be much better prepared to make use of it and, therefore, will be much more competent within the sector.





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*Become, through this university program,  
one of the most sought-after professionals  
in the Physical Activity and Sports sector”*

Although Hyperbaric Medicine has existed for over 200 years, many professionals from various specialties are still unfamiliar with its multiple applications and indications. The Master's Degree in Hyperbaric Medicine in Physical Activity and Sport will allow professionals to delve into the use of hyperbaric chambers as a means to heal injuries caused by sports activities. Additionally, this program will provide the skills to operate Hyperbaric Medicine chambers applied directly to any pathology arising from physical exercise.

The expansion of HBOT using lower treatment pressures has greater applications. It can be implemented by any professional in Sports Sciences with the corresponding training and adapts to the use of hyperbaric chambers that are more accessible and safer for both the patient and the chamber technician.

The presentation of this topic online, including theoretical content, specific subject videos, interactive classes, clinical case presentations, and tutored self-assessment quizzes, makes this Master's Degree unique within the sports specialty.

The goal is for professionals in Sports Sciences to recognize the benefits of hyperbaric chamber treatment for pathologies of various origins, understand the limitations and applications of the different chambers available on the market today, identify the contraindications of this treatment, and evaluate the response based on the effects reported in the literature.

Moreover, in-depth knowledge of the foundation and therapeutic effects will allow professionals to conduct clinical studies or case reviews to define and discover future applications of HBOT. In this way, the specialist will be equipped with the skills to actively participate in the use and expansion of this specialty within the field of Sports Sciences.

This program also includes 10 comprehensive Masterclasses, led by a renowned International Guest Director. An expert with various innovations in the field of Hyperbaric Medicine. All of this content will be accessible to graduates through an exclusive 100% online methodology and disruptive teaching systems like Relearning, of which TECH is a pioneer.

This **Master's Degree in Hyperbaric Medicine in Physical Activity and Sport** 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 experts in Hyperbaric Medicine and Sports
- ◆ 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
- ◆ The latest developments in Hyperbaric Medicine and its use in the field of sports
- ◆ Practical exercises where the self-assessment process can be carried out to improve learning
- ◆ Special emphasis on innovative methodologies in Hyperbaric Medicine.
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection work
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*Enroll now in this program at TECH, where you will have exclusive Masterclasses led by a renowned international expert in Hyperbaric Medicine and its relationship with Sport"*

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*Take advantage of this academic opportunity offered by TECH to grow within your profession while continuing with your daily activities”*

*Gain the most innovative tools and stand out in the field of Sports Hyperbaric Medicine.*

*Learn from the comfort of your home with a unique methodology, 24/7 access, and in just 12 months.*

The program includes a faculty made up of professionals from the field of Hyperbaric Medicine and Sports Sciences, who bring their work experience to this training, as well as recognized specialists from reference 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 specialist must try to solve the different professional practice situations that arise throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned experts in the field.



02

# Why Study at TECH?

TECH is the world's largest online university. With an impressive catalog of more than 14,000 university programs available in 11 languages, it is positioned as a leader in employability, with a 99% job placement rate. In addition, it relies on an enormous faculty of more than 6,000 professors of the highest international renown.





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*Study at the world's largest online university  
and guarantee your professional success.  
The future starts at TECH”*

**The world's best online university, according to FORBES**

The prestigious Forbes magazine, specialized in business and finance, has highlighted TECH as "the best online university in the world" This is what they have recently stated in an article in their digital edition in which they echo the success story of this institution, "thanks to the academic offer it provides, the selection of its teaching staff, and an innovative learning method oriented to form the professionals of the future".

**Forbes**

The best online university in the world

The most complete **syllabus**

**The most complete syllabuses on the university scene**

TECH offers the most complete syllabuses on the university scene, with programs that cover fundamental concepts and, at the same time, the main scientific advances in their specific scientific areas. In addition, these programs are continuously updated to guarantee students the academic vanguard and the most demanded professional skills. and the most in-demand professional competencies. In this way, the university's qualifications provide its graduates with a significant advantage to propel their careers to success.

**The best top international faculty**

TECH's faculty is made up of more than 6,000 professors of the highest international prestige. Professors, researchers and top executives of multinational companies, including Isaiah Covington, performance coach of the Boston Celtics; Magda Romanska, principal investigator at Harvard MetaLAB; Ignacio Wistumba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

**TOP**  
international faculty

The most effective methodology

**A unique learning method**

TECH is the first university to use Relearning in all its programs. This is the best online learning methodology, accredited with international teaching quality certifications, provided by prestigious educational agencies. In addition, this innovative academic model is complemented by the "Case Method", thereby configuring a unique online teaching strategy. Innovative teaching resources are also implemented, including detailed videos, infographics and interactive summaries.

**The world's largest online university**

TECH is the world's largest online university. We are the largest educational institution, with the best and widest digital educational catalog, one hundred percent online and covering most areas of knowledge. We offer the largest selection of our own degrees and accredited online undergraduate and postgraduate degrees. In total, more than 14,000 university programs, in ten different languages, making us the largest educational institution in the world.

**World's No.1**  
The World's largest online university

**The official online university of the NBA**

TECH is the official online university of the NBA. Thanks to our agreement with the biggest league in basketball, we offer our students exclusive university programs, as well as a wide variety of educational resources focused on the business of the league and other areas of the sports industry. Each program is made up of a uniquely designed syllabus and features exceptional guest hosts: professionals with a distinguished sports background who will offer their expertise on the most relevant topics.

**Leaders in employability**

TECH has become the leading university in employability. Ninety-nine percent of its students obtain jobs in the academic field they have studied within one year of completing any of the university's programs. A similar number achieve immediate career enhancement. All this thanks to a study methodology that bases its effectiveness on the acquisition of practical skills, which are absolutely necessary for professional development.



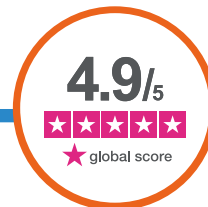
**Google Premier Partner**

The American technology giant has awarded TECH the Google Premier Partner badge. This award, which is only available to 3% of the world's companies, highlights the efficient, flexible and tailored experience that this university provides to students. The recognition not only accredits the maximum rigor, performance and investment in TECH's digital infrastructures, but also places this university as one of the world's leading technology companies.



**The official online university of the NBA**

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**The top-rated university by its students**

Students have positioned TECH as the world's top-rated university on the main review websites, with a highest rating of 4.9 out of 5, obtained from more than 1,000 reviews. These results consolidate TECH as the benchmark university institution at an international level, reflecting the excellence and positive impact of its educational model.

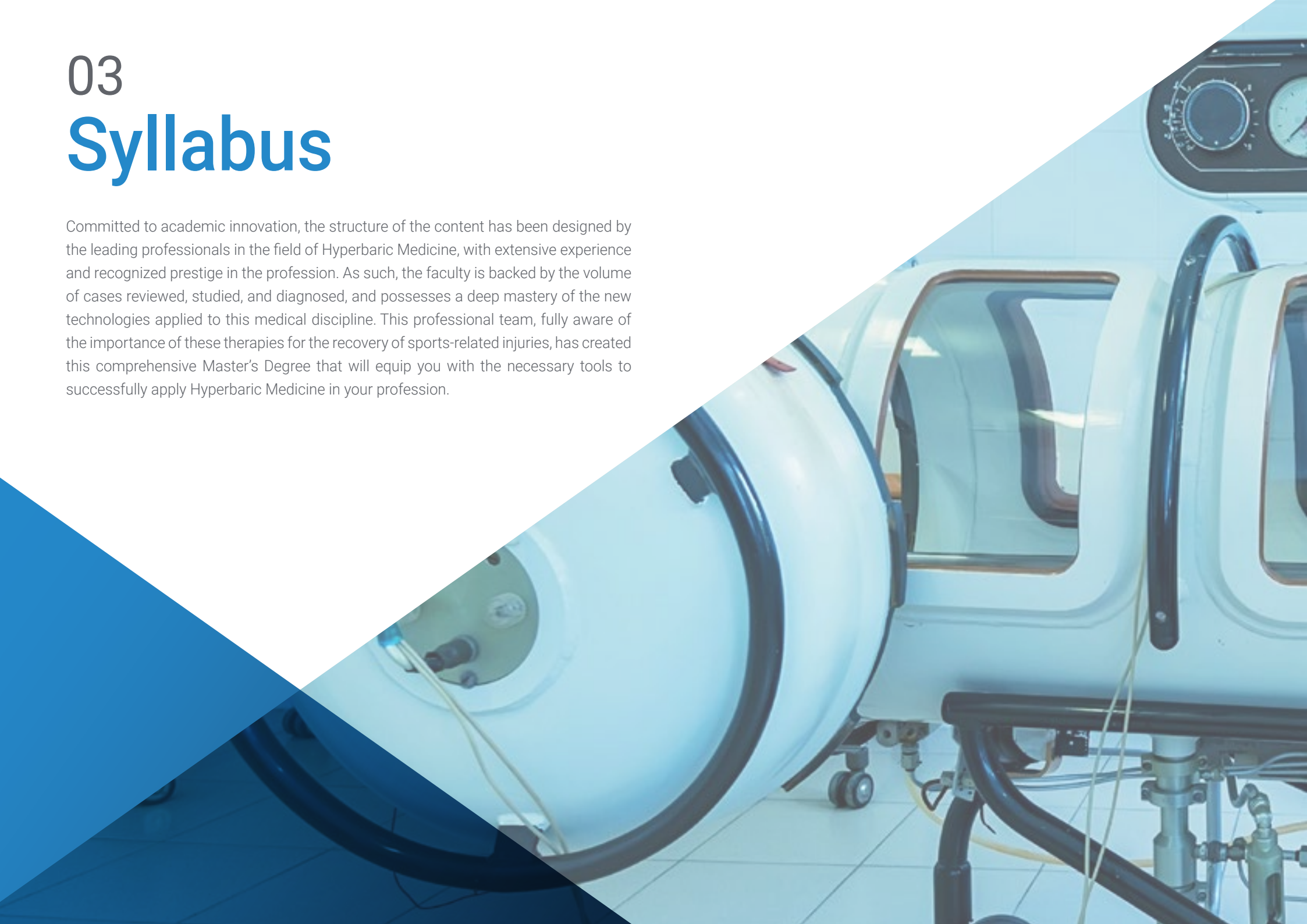


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# 03 Syllabus

Committed to academic innovation, the structure of the content has been designed by the leading professionals in the field of Hyperbaric Medicine, with extensive experience and recognized prestige in the profession. As such, the faculty is backed by the volume of cases reviewed, studied, and diagnosed, and possesses a deep mastery of the new technologies applied to this medical discipline. This professional team, fully aware of the importance of these therapies for the recovery of sports-related injuries, has created this comprehensive Master's Degree that will equip you with the necessary tools to successfully apply Hyperbaric Medicine in your profession.





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*The most complete and up-to-date compilation of content, specially designed to propel the professional in Sports Sciences to success”*

## Module 1. Introduction to Hyperbaric Medicine

- 1.1. History of Hyperbaric Medicine
- 1.2. Early Hyperbaric Chambers
- 1.3. Discovery of Oxygen
- 1.4. Scientific Period of Hyperbaric Medicine
- 1.5. Types of Hyperbaric Chambers: Revitalair Technology Chambers
- 1.6. Technical and Therapeutic Safety of New-Generation Hyperbaric Chambers
- 1.7. Hyperbaric Medicine Societies Worldwide and the Evolution of Indications
- 1.8. Introduction to the Fundamentals of Hyperbaric Oxygenation
- 1.9. Introduction to Adverse Effects and Contraindications
- 1.10. Current Concept of Hyperbaric Oxygenation Treatment: Medium Pressures, Micropressure, and Hyperbaria

## Module 2. Fundamentals of Hyperbaric Oxygenation Treatment (HBOT)

- 2.1. Physiological Bases of Hyperbaric Oxygenation Treatment
- 2.2. Physical Laws of Dalton, Henry, Boyle, and Mariotte
- 2.3. Physical and Mathematical Bases of Oxygen Diffusion in Tissues at Different Treatment Pressures: Krogh Model
- 2.4. Physiology of Oxygen
- 2.5. Physiology of Respiration
- 2.6. Volumetric and Solumetric Effect
- 2.7. Hypoxia: Types of Hypoxia
- 2.8. Hyperoxia and Treatment Pressure
- 2.9. Effective Hyperoxia in Wound Healing
- 2.10. Foundations of the Intermittent Hyperoxia Model

## Module 3. Therapeutic Physiological Effects of HBOT

- 3.1. Introduction to the Therapeutic Physiological Effects
- 3.2. Vasoconstriction
  - 3.2.1. Robin Hood Effect
  - 3.2.2. Effect of HBOT on Blood Pressure and Heart Rate
- 3.3. Stem Cells and Oxygen
  - 3.3.1. Release of Stem Cells with HBOT
  - 3.3.2. Importance of Stem Cells in Wound Healing
  - 3.3.3. Oxygen in Stem Cell Differentiation
- 3.4. Oxygen in Collagen Synthesis
  - 3.4.1. Synthesis and Types of Collagen
  - 3.4.2. Oxygen in Collagen Synthesis and Maturation
  - 3.4.3. HBOT and Collagen in Healing
- 3.5. Angiogenesis and Vasculogenesis
  - 3.5.1. Degenerative Angiogenesis and Hyperbaric Oxygen
- 3.6. Osteogenesis
  - 3.6.1. HBOT and Osteogenesis and Bone Resorption
- 3.7. Mitochondrial Function, Inflammation and Oxidative Stress
  - 3.7.1. Mitochondrial Dysfunction in the Pathogenesis of Various Pathologies
  - 3.7.2. HBOT and Mitochondrial Function
- 3.8. Oxidative Stress and Hyperbaric Oxygen
  - 3.8.1. Oxidative Stress in Different Pathologies
  - 3.8.2. Antioxidant Effect of Hyperbaric Oxygen
- 3.9. Anti-Inflammatory Effect of Hyperbaric Oxygen
  - 3.9.1. Hyperbaric Oxygen and Inflammation
- 3.10. Antimicrobial Effect of Hyperbaric Oxygen
  - 3.10.1. Bacterial Effect of Oxygen
  - 3.10.2. Hyperbaric Oxygen and Biofilm
  - 3.10.3. Hyperbaric Oxygen and the Immune Response
- 3.11. Oxygen and Neuronal Function
  - 3.11.1. Oxygen and Peripheral Axonal Regeneration
  - 3.11.2. Oxygen and Neuroplasticity

**Module 4. HBOT in Wound Healing and Infectious Pathology**

- 4.1. HBOT in Wound Healing Physiology
- 4.2. Medium Pressure and Wound Healing
  - 4.2.1. Effective Angiogenesis
  - 4.2.2. Equivalent Osteogenesis
  - 4.2.3. Anti-inflammatory Effect in Medium Pressure
- 4.3. Necrotizing Infections
- 4.4. HBOT in Chronic Ulcers and Diabetic Foot
- 4.5. Burns
- 4.6. Radiation-Induced Wounds and Hyperbaric Oxygen
- 4.7. HBOT in Crush Syndrome
- 4.8. Vasculitis and HBOT
- 4.9. HBOT in Pyoderma Gangrenosum
- 4.10. Evidence of HBOT in Other Wounds and Dermatological Conditions

**Module 5. HBOT in Pain, Rheumatic Pathology, and Medical Clinic**

- 5.1. HBOT in Altitude Sickness
- 5.2. Mechanisms of Action in Analgesia: Neuropathic Pain and Hyperbaric Oxygen
- 5.3. Arthropathies and Collagenopathies
- 5.4. HBOT in Dysfunctional Neurosensitive Syndromes
- 5.5. Fibromyalgia and Hyperbaric Oxygen
- 5.6. HBOT in Ischemia Reperfusion Injury
- 5.7. Tinnitus and Sudden Hearing Loss
- 5.8. Inflammatory Bowel Diseases and Hyperbaric Oxygen
- 5.9. HBOT in Fertility
- 5.10. Hyperbaric Oxygen in the Metabolism of Diabetes and Severe Anemia

**Module 6. HBOT in Physical and Neurological Rehabilitation**

- 6.1. HBOT in Recovery and Sports Performance
- 6.2. Hyperbaric Oxygen and Sports Injuries
- 6.3. Brain Trauma and Post-Contusion Syndrome
- 6.4. Stroke Recovery and Hyperbaric Oxygen
- 6.5. Cerebral Palsy and HBOT
- 6.6. Autism
- 6.7. Ischemic Encephalopathies
- 6.8. HBOT in Parkinson's
- 6.9. HBOT in Alzheimer's
- 6.10. HBOT in Traumatology (Avascular Necrosis, Bone Edema, Fractures, and Osteomyelitis)

**Module 7. HBOT in Oncology**

- 7.1. Hypoxia and Tumors
- 7.2. Tumor Angiogenesis
- 7.3. Oncological Safety of HBOT
- 7.4. HBOT and Radiosensitivity
- 7.5. HBOT and Chemotherapy
- 7.6. Osteoradionecrosis and Hyperbaric Oxygen
- 7.7. Radical Cystitis and Proctitis
- 7.8. Radiation-Induced Skin Syndrome and HBOT
- 7.9. HBOT in Other Radiological Injuries
- 7.10. HBOT in Cancer Pain and Quality of Life

### Module 8. HBOT in Toxicology

- 8.1. Bibliographic Evidence on Dose/Speed of Hyperbaric Oxygen in Carbon Monoxide Poisoning
- 8.2. Inflammation in Carbon Monoxide Poisoning
- 8.3. Delayed Neurological Syndrome
- 8.4. Smoke Inhalation and Hyperbaric Oxygen
- 8.5. HBOT in Cyanide Poisoning
- 8.6. HBOT in Poisoning by Other Gases
- 8.7. Hyperbaric Oxygen in Pollution and Smoking
- 8.8. Hyperbaric Oxygen in Addiction Recovery
- 8.9. HBOT in Lesions and Poisoning from Recluse Spider Bites
- 8.10. HBOT in Lesions and Poisoning from Snake Bites

### Module 9. HBOT in Dysbaric Pathology

- 9.1. Diving and Diving Medicine
  - 9.1.1. Physiological Reactions to Diving Conditions
  - 9.1.2. Neurological Syndrome of Deep Diving
- 9.2. Environmental Pressure Changes
  - 9.2.1. Decompression Sickness
  - 9.2.2. Air Embolism
  - 9.2.3. Pathophysiology
  - 9.2.4. Symptoms and Signs
- 9.3. Treatment of Decompression Sickness
  - 9.3.1. Prevention of Dysbaric Accidents
  - 9.3.2. Decompression Table
- 9.4. Dysbaric Pathology and Evidence-Based Medicine
- 9.5. Dysbaric Osteonecrosis
- 9.6. HBOT in Post-Surgical Gas Embolism: Iatrogenic Embolism







- 9.7. Hyperbaric Medicine in the Workplace
  - 9.7.1. Work in Compressed Air
  - 9.7.2. Medical Documentation and Dive Records
  - 9.7.3. Health Risks
- 9.8. Occupational Accidents in High-Pressure Chamber Operators: Medical Support and Treatment for Compressed Air Work
- 9.9. Fire: Evaluation and Prevention with Hyperbaric Chambers with Combustion Risk
- 9.10. Regulations and Requirements for the Installation of Different Types of Hyperbaric Chambers

## Module 10. Indications and Contraindications

- 10.1. Absolute and Relative Contraindications of HBOT
- 10.2. Adverse Effects of Hyperoxia
- 10.3. Neurotoxic and Pulmonary Toxicity of Oxygen
- 10.4. Neurotoxicity/Neuroexcitability
- 10.5. Objective and Subjective Barotrauma
- 10.6. Special Care in Patients Receiving HBOT at Different Pressures
- 10.7. Consensus Indications from the European Committee of Hyperbaric Medicine
- 10.8. Emerging Medical Applications: Off-Label Indications and Medicare
- 10.9. Management in Hyperbaric Medicine Centers: HBOT in Public and Private Health
- 10.10. Cost/Benefit Relationship of HBOT Application: Cost Effectiveness of HBOT



*Learn everything you need to act safely and efficiently, providing the proper response to each athlete's needs"*

04

# Teaching Objectives

The main objective of the Master's Degree in Hyperbaric Medicine in Physical Activity and Sport is to provide healthcare and sports professionals with in-depth knowledge of the principles, applications, and benefits of hyperbaric oxygenation treatment. This training approach is specially designed to address pathologies and injuries arising from physical activity, offering advanced tools for treatment and recovery. Through a theoretical-practical approach, the program aims for specialists to incorporate this innovative treatment into their daily practice, significantly enhancing their skills, competencies, and knowledge in the use of hyperbaric medicine applied to the sports field.



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*Our goal is to provide you with the best academic option to become a renowned professional in the field of Hyperbaric Medicine”*



## General Objectives

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- Understand the scientific foundations of Hyperbaric Medicine, including its historical evolution, physiological bases, and physical principles, for its correct application in the clinical field
- Identify the indications and contraindications of HBOT, considering its effectiveness in various pathologies, from infectious diseases to neurological and oncological conditions
- Evaluate the physiological and therapeutic effects of Hyperbaric Oxygen, including its anti-inflammatory, antimicrobial, neuroprotective, and analgesic actions in different pathologies
- Acquire knowledge about the application of HBOT in physical and neurological rehabilitation, its utility in treating sports injuries, neurodegenerative diseases, and autism spectrum disorders
- Explore the relationship between hyperbaric medicine and toxicology, understanding its role in carbon monoxide poisoning, toxin exposure, and addiction recovery
- Learn the fundamentals of dysbaric medicine and the effects of environmental pressure on the body, allowing for the proper management of pathologies related to diving and exposure to therapeutic protocols and regulations in different healthcare settings





## Specific Objectives

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### Module 1. Introduction to Hyperbaric Medicine

- ◆ Understand the historical evolution of Hyperbaric Medicine, from its origins to current technological innovations in hyperbaric chambers
- ◆ Identify the fundamental principles of Hyperbaric Oxygenation, including its scientific bases and therapeutic applications
- ◆ Differentiate types of hyperbaric chambers and their characteristics, with emphasis on technological advances and safety measures
- ◆ Recognize major Hyperbaric Medicine societies worldwide and their influence on clinical indications

### Module 2. Fundamentals of Hyperbaric Oxygenation Treatment (HBOT)

- ◆ Analyze the physiological bases of Hyperbaric Oxygen Therapy (HBOT) to understand its impact on cellular and tissue processes
- ◆ Interpret the physical laws governing gas diffusion and their application in Hyperbaric Oxygenation
- ◆ Relate the effects of hypoxia and hyperoxia to different pressure levels used in hyperbaric treatment
- ◆ Explain the intermittent hyperoxia model and its relevance to wound healing and other clinical applications

### **Module 3. Therapeutic Physiological Effects of HBOT**

- ♦ Describe the therapeutic physiological effects of HBOT and its influence on various body systems
- ♦ Relate vasoconstriction induced by HBOT with benefits in regulating blood pressure and heart rate
- ♦ Explain the role of hyperbaric oxygen in cell regeneration, including stem cell release and its importance in wound healing
- ♦ Analyze the influence of HBOT on collagen synthesis, angiogenesis, and osteogenesis, and its impact on tissue and bone repair
- ♦ Evaluate the effect of hyperbaric oxygen on oxidative stress and inflammation, considering its antioxidant and anti-inflammatory potential
- ♦ Explore the action of HBOT on neuronal function, including its impact on axonal regeneration and neuroplasticity

### **Module 4. HBOT in Wound Healing and Infectious Pathology**

- ♦ Explain the impact of HBOT on wound healing processes, highlighting its influence on angiogenesis, osteogenesis, and inflammation reduction
- ♦ Identify the benefits of HBOT in treating infectious pathologies, including necrotizing infections and biofilm-complicated wounds
- ♦ Analyze the application of HBOT in complex wounds, such as chronic ulcers, burns, and radiation injuries, to optimize tissue regeneration
- ♦ Evaluate scientific evidence on the use of HBOT in dermatological conditions and inflammatory pathologies, such as vasculitis and pyoderma gangrenosum

### **Module 5. HBOT in Pain, Rheumatic Pathology, and Medical Clinic**

- ♦ Describe the mechanisms of action of HBOT in pain relief, with special emphasis on its effect on neuropathic pain and rheumatic pathologies
- ♦ Relate the use of HBOT with improvement in complex clinical conditions such as ischemia-reperfusion, fibromyalgia, and dysfunctional neuro-sensory syndromes
- ♦ Analyze scientific evidence on the application of HBOT in metabolic and inflammatory diseases, including diabetes, severe anemia, and intestinal pathologies
- ♦ Explore the impact of HBOT on hearing recovery and fertility, evaluating its role in treating tinnitus, sudden deafness, and reproductive dysfunctions

### **Module 6. HBOT in Physical and Neurological Rehabilitation**

- ♦ Identify the benefits of HBOT in neurological rehabilitation, considering its impact on recovery from stroke, post-concussion syndrome, and ischemic encephalopathies
- ♦ Explain the application of HBOT in neurodegenerative and developmental disorders, such as Parkinson's, Alzheimer's, and autism
- ♦ Relate the use of HBOT with improved sports performance and recovery from musculoskeletal injuries, including fractures, avascular necrosis, and bone edema
- ♦ Describe scientific evidence on the effectiveness of HBOT in rehabilitating patients with cerebral palsy, highlighting its possible benefits on motor and cognitive functions

**Module 7. HBOT in Oncology**

- ♦ Explain the relationship between tumor hypoxia and the effect of HBOT, considering its impact on tumor angiogenesis
- ♦ Describe the safety of HBOT in oncology patients, addressing its use in combination with radiotherapy and chemotherapy
- ♦ Relate HBOT to the prevention and treatment of complications arising from radiotherapy, such as osteoradionecrosis, cystitis, and radiation proctitis
- ♦ Examine the role of HBOT in improving cancer pain (oncodynia) and quality of life in oncology patients, considering its effect on tissue recovery

**Module 8. HBOT in Toxicology**

- ♦ Describe scientific evidence regarding the relationship between HBOT dose and speed of administration in cases of carbon monoxide poisoning
- ♦ Explain the role of HBOT in reducing inflammation and preventing delayed neurological syndrome after carbon monoxide poisoning
- ♦ Relate HBOT to the neutralization of toxins in cyanide and other gas poisonings, addressing its mechanisms of action
- ♦ Examine the application of HBOT in smoke inhalation, analyzing its benefits in oxygenation and pulmonary recovery
- ♦ Explore the impact of HBOT in addiction recovery and mitigating the effects of pollution and smoking, considering its cellular-level effects
- ♦ Determine the effect of HBOT in treating poisonings from spider and snake bites, focusing on tissue regeneration and reducing inflammatory damage

**Module 9. HBOT in Dysbaric Pathology**

- ♦ Describe physiological reactions of the body to diving conditions, addressing deep-depth neurological syndrome
- ♦ Explain the pathophysiological mechanisms of decompression sickness and air embolism, including symptoms, signs, and risk factors
- ♦ Relate Hyperbaric Medicine to the prevention and treatment of dysbaric accidents, considering the use of decompression tables
- ♦ Analyze the application of HBOT in postoperative gas embolism and its role in managing iatrogenic embolism
- ♦ Examine occupational risks associated with working in compressed air and the role of hyperbaric medicine in prevention and treatment
- ♦ Identify regulations and requirements for the installation and operation of hyperbaric chambers, ensuring safe use in various settings

**Module 10. Indications and Contraindications**

- ♦ Identify absolute and relative contraindications for HBOT, considering risk factors and conditions that limit its application
- ♦ Explain the adverse effects of hyperoxia on the body, with special emphasis on neuronal and pulmonary toxicity of oxygen
- ♦ Relate barotrauma to HBOT, distinguishing between objective and subjective manifestations
- ♦ Describe clinical indications for HBOT based on international consensus, addressing its approved use and emerging applications in modern medicine

# 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

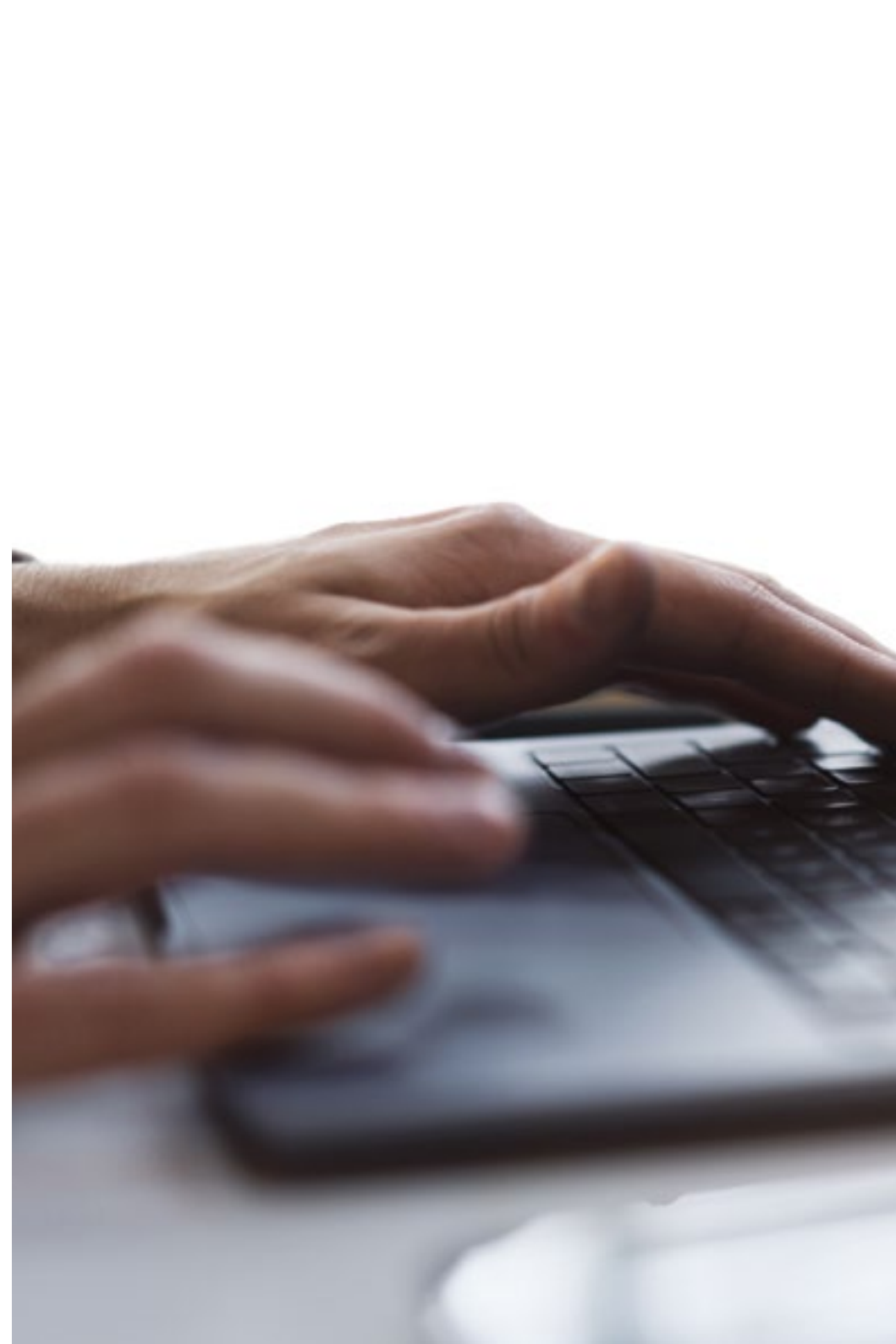
In TECH's study methodology, the student is the main protagonist.

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.

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*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".

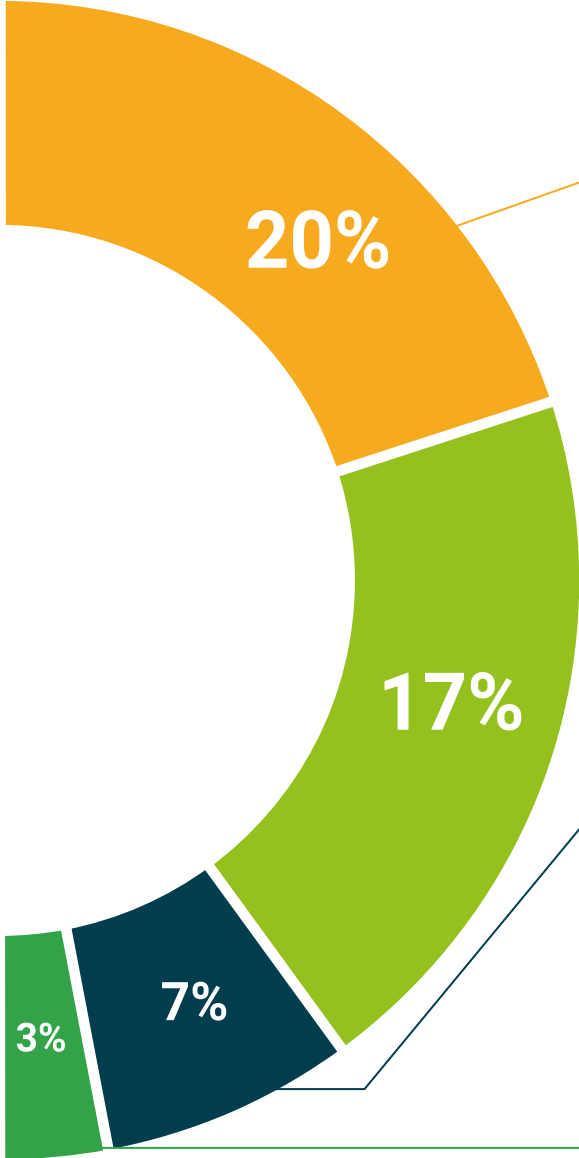


#### Additional Reading

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







**Case Studies**

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.



**Testing & Retesting**

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.



**Classes**

There is scientific evidence suggesting that observing third-party experts can be useful.  
Learning from an expert strengthens knowledge and memory, and generates confidence for 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

# Teaching Staff

The program includes a faculty composed of leading experts in Hyperbaric Medicine, who bring their extensive experience to the course with the goal of teaching students how to use hyperbaric therapy as a means to address pathologies and injuries arising from sports and/or physical activity. Furthermore, renowned specialists from various disciplines contribute to the design and development of the program, ensuring an interdisciplinary approach. This will enable professionals to acquire the ideal transversal knowledge to apply these treatments in various scenarios.



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*An exclusive opportunity to learn from the best in Hyperbaric Medicine and expand your skills as a sports professional”*

## International Guest Director

Dr. Peter Lindholm is an eminence in Hyperbaric Medicine and the approach to Respiratory Disorders. His research has been focused on the Pathophysiology of Lung Diving, exploring topics such as Hypoxia and loss of consciousness.

Specifically, this expert has analyzed in depth the effects of the medical condition known as Lungsqueeze, frequent in divers. Among his most important contributions in this area is a detailed review of how glossopharyngeal breathing can extend lung capacity beyond normal limits. In addition, he described the first case series linking glossopharyngeal insufflation with cerebral gas embolism.

At the same time, he has been a pioneer in proposing the term *Tracheal Squeeze* as an alternative to pulmonary edema in divers who bleed after deep dives. On the other hand, the specialist has shown that exercise and fasting before diving increase the risk of loss of consciousness, similar to hyperventilation. In this way, he has developed an innovative method to use Magnetic Resonance Imaging in the diagnosis of Pulmonary Embolism. In the same way, he has delved into new techniques for measuring hyperbaric oxygen therapy.

Dr. Lindholm also serves as Director of the Endowed Gurneee Chair of Diving and Hyperbaric Medicine Research in the Department of Emergency Medicine at the University of California, San Diego, United States. Likewise, this renowned expert spent several years at Karolinska University Hospital. In that institution he worked as Director of Thoracic Radiology. He also has vast experience in diagnosis by means of clinical imaging based on radiation, and has even given lectures on the subject at the prestigious Karolinska Institute in Sweden. He is also a regular speaker at international conferences and has numerous scientific publications.



## Dr. Lindholm, Peter

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- Chair of Hyperpathic Medicine and Diving at the University of California, San Diego, United States
- Director of Thoracic Radiology at the Karolinska University Hospital
- Professor of Physiology and Pharmacology at Karolinska Institute in Sweden
- Reviewer for international scientific journals such as American Journal of Physiology and JAMA
- Medical Residency in Radiology at the Karolinska University Hospital
- Doctor of Science and Physiology, Karolinska Institute, Sweden

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

## Management



### Dr. Cannellotto, Mariana

- ♦ Specialist in Hyperbaric Medicine
- ♦ Medical Director from BioBarica - Hyperbaric Systems
- ♦ Clinical Physician at CES SRL
- ♦ President of Argentina Association of Hyperbaric Medicine and Research
- ♦ President of Ihmera

## Teachers

### Ms. Jordá Vargas, Liliana

- ♦ Clinical Biochemistry and Microbiology Expert
- ♦ Scientific Director from BioBarica - Hyperbaric Systems
- ♦ Microbiologist at CRAI Norte
- ♦ Bacteriologist at Vélez Sarsfield Hospital
- ♦ Scientific Director of AAMHEI and AEMHEI
- ♦ Degree in Biochemistry from the National University of Córdoba
- ♦ Biochemistry and Clinical Microbiology, University Institute CEMIC

### Dr. Emilia Fraga, Pilar María

- ♦ Director of the Scientific and Clinical Research Division at Biobarica
- ♦ Food evaluator at the National Food Institute
- ♦ Professor of Anatomy and Physiology at ADEF
- ♦ Degree in Biochemistry from Arturo Jauretche National University

**Dr. Schedler, Olaf**

- ◆ Chief Physician at Bavaria Kreischach Clinic for Sports Medicine and Hyperbaric Oxygen Therapy
- ◆ Professor of Medical Measurement Technology at Brandenburg Technical University Cottbus-Senftenberg
- ◆ Professor of Emergency Medicine at the Berlin University of Applied Sciences for Health and Sport
- ◆ Professor of Physics, Biomechanics, and Equipment Technology at the University of Würzburg and Coburg-Schloss Hohenfels
- ◆ Doctor of Medicine from Humboldt University of Berlin
- ◆ Researcher and Study Physician at the Berlin Clinical Research Institute
- ◆ Scientist and Physician at the Federal Center for Hyperbaric Chamber Research and Education
- ◆ Associate Researcher at Charité-Universitätsmedizin Berlin
- ◆ Associate Researcher at Brandenburg Anesthesia and Intensive Care Medicine and Heart Center
- ◆ Research Assistant at the Anesthesia Clinic (Prof. Dr. Zietz) and Oskar Ziethen Hospital Berlin
- ◆ Research Assistant at ADAC Luftrettung Senftenberg
- ◆ Medical Director of the Rescue Service at Malteser Hilfsdienst Berlin
- ◆ Head of the Emergency Training Center and Maritime Medicine Section at Unfallkrankenhaus Berlin
- ◆ Chief of the Central Emergency and Rescue Medicine Department at Helios Clinic Bad Saarow
- ◆ Senior Physician of Helicopter Christoph 49
- ◆ Program Coordinator for Rescue Medicine at Charité-Universitätsmedizin Berlin
- ◆ Specialist in Anesthesiology certified by the Medical Chamber of Berlin
- ◆ Specialist in Intensive Care and Pain Therapy at the University of Berlin
- ◆ Graduate in Medical Economics from the German School of Applied Sciences
- ◆ Graduated in Physiotherapy from the "Dr. Otto Schlein" Medical College in Magdeburg
- ◆ Expert in Transfusional Medicine and Immunohematology from the German Society of Transfusional Medicine and Immunohematology
- ◆ Expert in Intensive Transport Medicine from the German Interdisciplinary Society of Intensive and Emergency Medicine
- ◆ Expert in Quality Management in Clinical Research from the European Medical Research and Quality Management Association
- ◆ Expert in Diving Medicine from the German Society of Diving Medicine and Hyperbaric Medicine
- ◆ Expert in Clinical Hyperbaric Medicine from the German Society of Diving Medicine and Hyperbaric Medicine

**Dr. Verdini, Fabrizio**

- ◆ Clinical Doctor at BioBarica Hyperbaric Systems
- ◆ Director of Health Programs at Camp La Llanada
- ◆ General Practitioner at Doctor Armando Mata Sanchez Hospital
- ◆ Doctor of Medicine from the University of Carabobo
- ◆ Master's Degree in Hyperbaric Medicine from the CEU Cardenal Herrera University.
- ◆ Master's Degree of Business Administration healthcare, Polytechnic University of Puerto Rico

**Dr. Ramallo, Rubén Leonardo**

- ◆ Attending Physician Specialist in Medical Clinic at the General Hospital of Acute Diseases.
- ◆ Physician in Hyperbaric Medicine. Biobarica Hyperbaric Systems
- ◆ Medical Surgeon Faculty of Medical Sciences. National University of Córdoba
- ◆ Specialist in Internal Medicine. Residency in Internal Medicine, Córdoba Hospital
- ◆ Master's Degree in Psychoimmunoneuroendocrinology. Favaloro University
- ◆ Director of the AAMHEI Medical Clinic Commission







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*A unique, essential and decisive learning experience to boost your professional development”*

# 07 Certificate

This Master's Degree in Hyperbaric Medicine in Physical Activity and Sport guarantees students, in addition to the most rigorous and up-to-date education, access to a diploma for the Master's Degree 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 diploma for the **Master's Degree in Hyperbaric Medicine in Physical Activity and Sport** 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.

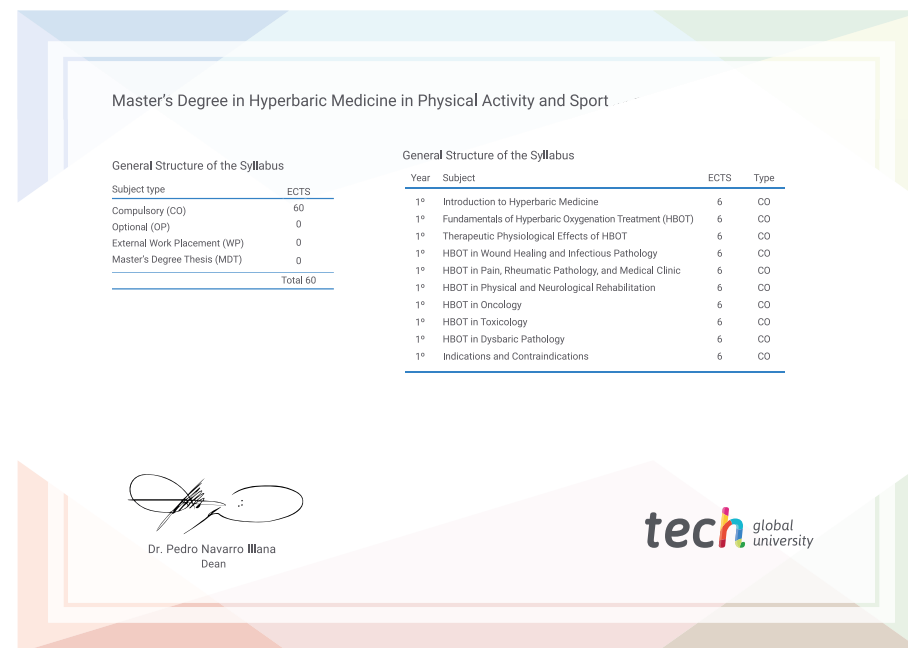
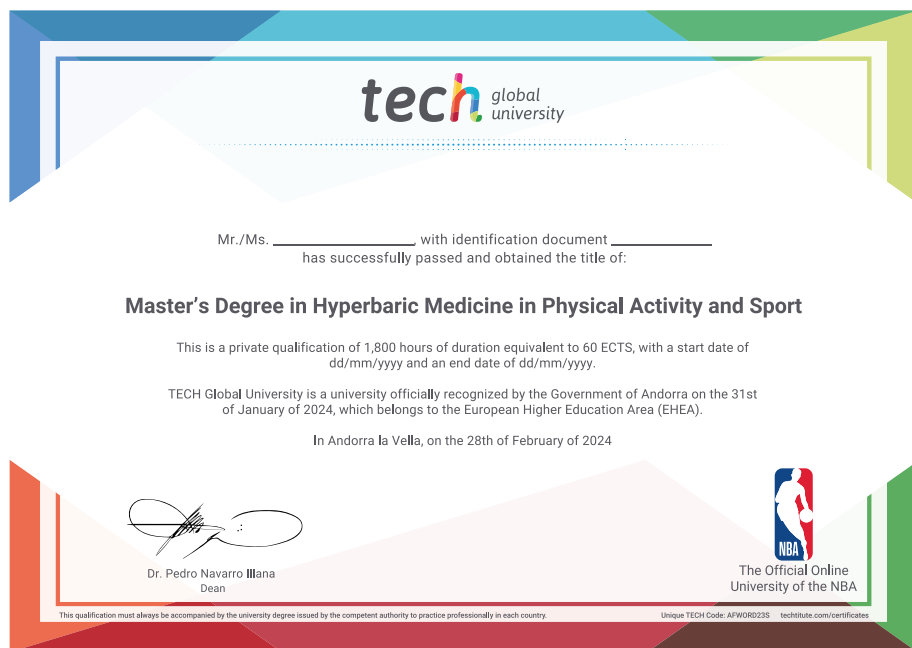
This **TECH Global University** private qualification, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Master's Degree in Hyperbaric Medicine in Physical Activity and Sport**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**



\*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.



**Master's Degree**  
Hyperbaric Medicine  
in Physical Activity  
and Sport

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

# Master's Degree

## Hyperbaric Medicine in Physical Activity and Sport

Endorsed by the NBA

