



# Postgraduate Diploma

Electrotherapy and Analgesia

» Modality: online

» Duration: 6 months

» Certificate: TECH Technological University

» Dedication: 16h/week

» Schedule: at your own pace

» Exams: online

Website: www.techtitute.com/in/physiotherapy/postgraduate-diploma/postgraduate-diploma-electrotherapy-analgesia

# Index

 $\begin{array}{c|c} 01 & 02 \\ \hline & & \\ \hline &$ 

06 Certificate

p. 32





### tech 06 | Introduction

Until a few years ago, finding a non-invasive, simple physiotherapeutic technique that did not cause side effects for the treatment of muscular injuries such as atrophy, contractures or paralysis, among others, as well as their comorbidities (headaches, cognitive problems, reduced mobility, etc.) was an impossible task.

However, thanks to the development of Electrotherapy and its multiple analgesic techniques, it has been feasible to effectively address countless pathologies through electrical stimulation pulses to the sensory nerves, achieving a considerable decrease in pain and becoming an effective alternative to traditional anti-inflammatory and relaxing pharmacological treatments.

However, this is an area that contemplates a wide range of possibilities, not only because of the different techniques that exist, but also because of the specificity of its application depending on the characteristics of the patient. Therefore, TECH has considered necessary the development of a program that serves as a guide to the professional physiotherapists in their update, compacting in a qualification the most comprehensive and innovative information related to ultrasound therapy and high-frequency electrotherapy. In this way, the graduates will be able to delve into its technical recommendations, as well as the advantages and benefits of its use according to the patient's condition, giving them the guidelines to improve their skills based on the use of the most innovative therapeutic tools that exist today.

All this 100% online through 450 hours of theoretical, practical and additional content, the latter presented in various formats: research articles, complementary readings, news, dynamic summaries, detailed videos, self-knowledge exercises, images, dynamic summaries and much more. You will also be supported by a team of Physiotherapy faculty whose expertise will help guide you through the program and help you get the most out of it.

This **Postgraduate Diploma in Electrotherapy and Analgesia** 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 Physiotherapy and Electrotherapy
- 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
- 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



A multidisciplinary program with which you will be able to approach ultrasound therapy from the base and up to the most innovative concepts, so that you will be updated in its use in a guaranteed way"



You will work intensively in the achievement of the best analgesic effects through electrotherapy and the most innovative techniques for its use"

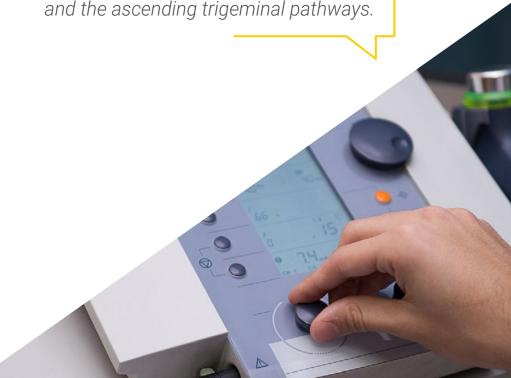
The program's teaching staff includes professionals from the field who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

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.

You will have access to 450 hours of the best theoretical, practical and additional content to expand each section of the syllabus in a personalized way based on your own requirements.

A program that will give you the keys to master nociception based on the updated knowledge of the main receptors and the ascending trigeminal pathways.







# tech 10 | Objectives



### **General Objectives**

- Develop an updated and broad knowledge of the most innovative techniques related to Electrotherapy and Analgesia
- Provide the graduates with all the resources they need to implement in their practice the most avant-garde ultrasound therapy trends in the current sector



A program designed with the objective that you will surpass your own through specialized knowledge of the different analgesic techniques through electrostimulation"





### **Specific Objectives**

#### Module 1. High Frequency Electrotherapy

- Update your knowledge of Electrotherapy in the field of rehabilitation of patients with neurological pathology
- \* Revise the concepts concerning the physiology of Electrotherapy in the neuromusculoskeletal patient

#### Module 2. Ultrasound Therapy in Physiotherapy

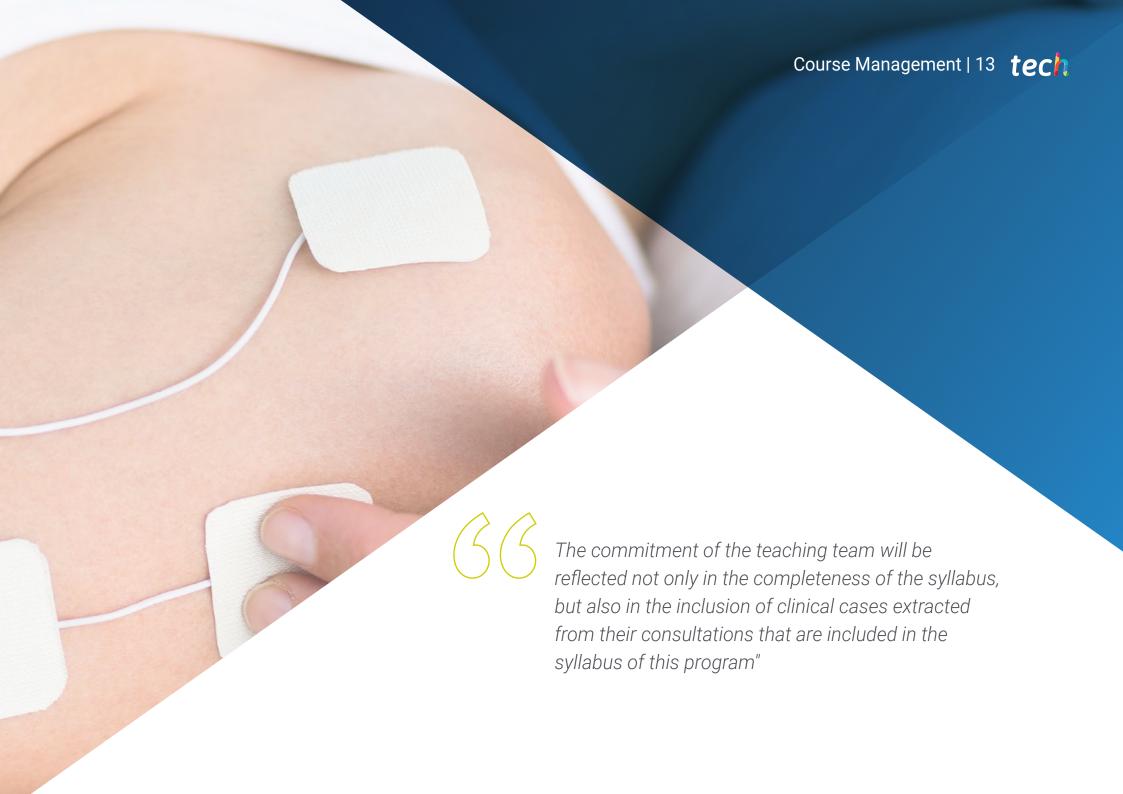
- Identify current and developing therapeutic possibilities in the field of neuromusculoskeletal rehabilitation
- Update your knowledge of nociceptive transmission, as well as its modulation mechanisms by physical means

#### Module 3. Electrotherapy and Analgesia

- Broaden the knowledge of new applications of electrotherapy in the rehabilitation of urogynecological pathologies
- Delve into electrotherapy in the field of rehabilitation of patients with musculoskeletal pathology







### tech 14 | Course Management

### Management



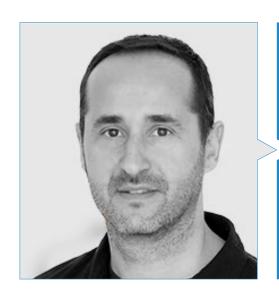
### Ms. Sanz Sánchez, Marta

- Physiotherapy Supervisor at the Hospital Universitario 12 de Octubre
- Graduate in Physiotherapy from the School of Nursing and Physiotherapy of the University of Comillas
- Degree in Physiotherapy from the School of Nursing and Physiotherapy of the University of Alcalá de Henares
- Associate Professor at the Complutense University of Madrid



### Mr. Hernández, Leonardo

- Supervisor of the Rehabilitation Service Unit of the 12 de Octubre University Hospital
- Physiotherapist at the University Hospital of Guadalajara
- Postgraduate Certificate in Physiotherapy from the European University of Madrid
- Degree in Physiotherapy from Comillas Pontifical University
- Professonal Master's Degree in Osteopathy by Gimbernat University School



### Dr. León Hernández, Jose Vicente

- Physiotherapist expert in the Study and Treatment of Pain and Manual Therapy
- PhD in Physiotherapy from the Rey Juan Carlos University
- Professional Master's Degree in the Study and Treatment of Pain from the Rey Juan Carlos University
- Degree in Chemical Sciences from the Complutense University of Madrid, specializing in Biochemistry
- Postgraduate Certificate in Physiotherapy from the Alfonso X el Sabio University
- Member and training coordinator at the Institute of Neuroscience and Movement Sciences

### **High School**

#### Mr. Losana Ferrer, Alejandro

- Clinical Physiotherapist and Trainer in New Technologies for Rehabilitation at Rebiotex
- Physiotherapist at CEMTRO Clinic
- Professional Master's Degree in Advanced Physiotherapy in Musculoskeletal Pain Management
- Postgraduate Diploma in Neuroorthopedic Manual Therapy
- University Advanced Training in Therapeutic Exercise and Invasive Physiotherapy for Musculoskeletal Pain
- Graduate in Physiotherapy in La Salle

#### Mr. Suso Martí, Luis

- Physiotherapist
- Researcher at the Institute for Neurosciences and Movement Sciences
- Contributor to the popular science magazine NeuroRhab News
- Physiotherapy Degree: University of Valencia
- Doctorate, Autonomous University of Madrid
- Degree in Psychology. Open University of Catalonia
- Professional Master's Degree in "Advanced Physiotherapy in Pain Management"

### tech 16 | Course Management

#### Ms. Merayo Fernández, Lucía

- Physiotherapist Expert in Pain Management
- Physiotherapist in the Navarra Health Service
- Physiotherapist. Doctor San Martin Ambulatory
- Degree in Physiotherapy
- Professional Master's Degree in Advanced Physiotherapy in Musculoskeletal Pain Management

#### Dr. Cuenca - Martínez, Ferrán

- Physiotherapist Expert in Pain Management
- Physiotherapist at FisioCranioClinic
- Physiotherapist at the Institute of Functional Rehabilitation La Salle
- Researcher at the Center for Higher University Studies (CSEU La Salle)
- Researcher at EXINH Research Group
- Researcher in the Motion in Brans Research Group of the Institute of Neuroscience and Movement Sciences (INCIMOV)
- Chief editor of The Journal of Move and Therapeutic Science
- Editor and publisher of NeuroRehab News magazine
- Author of several scientific articles in national and international journals
- PhD in Medicine and Surgery from the Autonomous University of Madrid
- Graduate in Physiotherapy from the University of Valencia

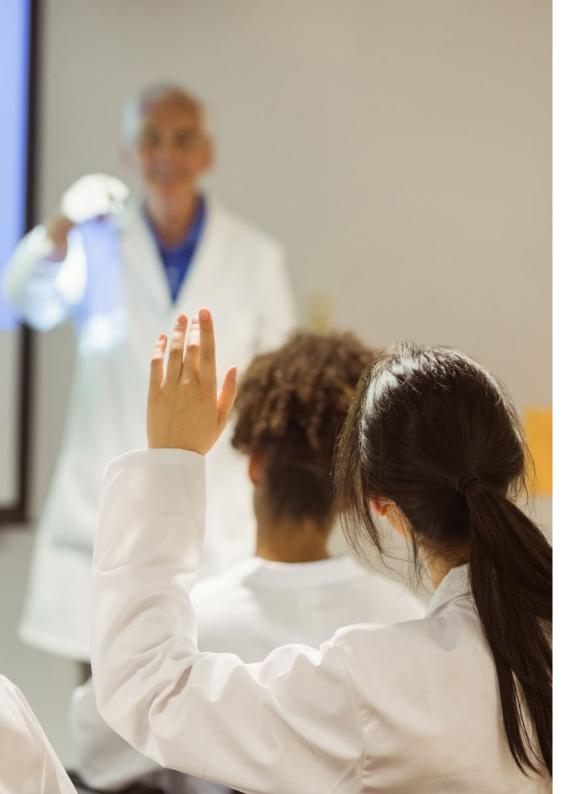
• Professional Master's Degree in Advanced Physiotherapy in Pain Treatment by the UAM

#### Dr. Gurdiel Álvarez, Francisco

- Physiotherapist at Powerexplosive
- Physiotherapist at Fisad Clinic
- Physiotherapist for Ponferradina Sports Society
- PhD in Health Sciences from the Rey Juan Carlos University
- Degree in Physiotherapy by the University of Leon
- Degree in Psychology from UNED
- Professional Master's Degree in Advanced Physiotherapy in the Treatment of Musculoskeletal Pain by the Autonomous University of Madrid
- Postgraduate Diploma in Orthopedic Manual Therapy and Myofascial Pain Syndrome by the European University

#### Mr. Izquierdo García, Juan

- Physiotherapist at the Cardiac Rehabilitation Unit of the 12 de Octubre University Hospital
- Postgraduate Certificate in Physiotherapy from the Rey Juan Carlos University
- University Specialist in Heart Failure by the University of Murcia
- Professional Master's Degree in Health Care Management from the University of the Mid-Atlantic
- Postgraduate Diploma in Manual Therapy in Muscular and Neuromeningeal Tissue by the Universidad Rey Juan Carlos
- Member of: Multidisciplinary Cardiac Rehabilitation Unit of the 12 de Octubre University Hospital



### Course Management | 17 tech

#### Mr. Román Moraleda, Carlos

- Physiotherapist at the 12 de Octubre University Hospital
- Physiotherapist at the Paseo Imperial Health Center and at the Primary Care Service of the Hospital Universitario La Paz
- Specialist in the Lymphatic Drainage Unit at the Hospital Universitario La Paz
- Physiotherapist at the "José Villarreal" Day Care Center, Madrid
- Postgraduate Diploma in Manual Lymphatic Drainage by the European University of Madrid
- Professional Master's Degree in Osteopathy (Eur. Ost DO). Francisco de Vitoria University-School of Osteopathy. FBEO





### tech 20 | Structure and Content

#### Module 1. High Frequency Electrotherapy

- 1.1. Physical Fundamentals of High Frequency
- 1.2. Physiological Effects of High Frequency
  - 1.2.1. Athermal Effects
  - 1.2.2. Thermal Effects
- 1.3. Therapeutic Effects of High Frequency
  - 1.3.1. Athermal Effects
  - 1.3.2. Thermal Effects
- 1.4. Shortwave Fundamentals
  - 1.4.1. Shortwave: Capacitive Application Mode
  - 1.4.2. Shortwave: Inductive Application Mode
  - 1.4.3. Shortwave: Pulsed Emission Mode
- 1.5. Practical Applications of Shortwave
  - 1.5.1. Practical Applications of Continuous Shortwave
  - 1.5.2. Practical Applications of Pulsed Shortwave
  - 1.5.3. Practical Shortwave Applications: Pathology Phase and Protocols
- 1.6. Contraindications of Shortwave
  - 1.6.1 Absolute Contra-indications
  - 1.6.2. Relative Contra-indications
  - 1.6.3. Precautions and Safety Measures
- 1.7. Practical Applications of the Microwave
  - 1.7.1. Microwave Basics
  - 1.7.2 Practical Microwave Considerations
  - 1.7.3. Practical Applications of Continuous Microwave
  - 1.7.4. Practical Applications of Pulsed Microwave
  - 1.7.5. Microwave Treatment Protocols
- 1.8. Contraindications of the Microwave
  - 1.8.1. Absolute Contra-indications
  - 1.8.2. Relative Contra-indications

- .9. Fundamentals of Techartherapy
  - 1.9.1. Physiological Effects of Techarterapy
  - 1.9.2. Dosage of Tecartherapy Treatment
- 1.10. Practical Applications of Techartherapy
  - 1.10.1. Arthrosis
  - 1.10.2. Myalgia
  - 1.10.3. Muscle Fibrillar Rupture
  - 1.10.4. Myofascial Trigger Point Postpuncture Pain
  - 1.10.5. Tendinopathy
  - 1.10.6. Tendon Rupture (Post-Surgical Period)
  - 1.10.7. Wound Healing
  - 1.10.8. Keloid Scars
  - 1.10.9. Edema Drainage
  - 1.10.10. Post-Exercise Recovery
- 1.11. Contraindications of Techartherapy
  - 1.11.1. Absolute Contra-indications
  - 1.11.2. Relative Contra-indications

### Module 2. Ultrasound Therapy in Physiotherapy

- 2.1. Physical Principles of Ultrasound Therapy
  - 2.1.1. Definition of Ultrasound Therapy
  - 2.1.2. Main Physical Principles of Ultrasound Therapy
- 2.2. Physiological Effects of Ultrasound Therapy
  - 2.2.1. Mechanisms of Action of Therapeutic Ultrasound
  - 2.2.2. Therapeutic Effects of Ultrasound Therapy
- 2.3. Main Parameters of Ultrasound Therapy
- 2.4. Practical Applications
  - 2.4.1. Ultrasound Treatment Methodology
  - 2.4.2. Practical Applications and Indications of Ultrasound Therapy
  - 2.4.3. Ultrasound Therapy Research Studies

### Structure and Content | 21 tech

- 2.5. Ultrasonophoresis
  - 2.5.1. Definition of Ultrasonophoresis
  - 2.5.2. Mechanisms of Ultrasonophoresis
  - 2.5.3. Factors on Which the Effectiveness of Ultrasonophoresis Depends
  - 2.5.4. Ultrasonophoresis Considerations to Take into Account
  - 2.5.5. Research Studies on Ultrasonophoresis
- 2.6. Contraindications to Ultrasound Therapy
  - 2.6.1. Absolute Contra-indications
  - 2.6.2. Relative Contra-indications
  - 2.6.3. Precautions
  - 2.6.4. Recommendations
  - 2.6.5. Contraindications to Ultrasonophoresis
- 2.7. High Frequency Ultrasound Therapy (HFUPT)
  - 2.7.1. Definition of HFPW Therapy
  - 2.7.2. Parameters of HFPW Therapy and HIFU Therapy
- 2.8. Practical Applications of High Frequency Ultrasound Therapy
  - 2.8.1. Indications for HFPW and HIFU Therapy
  - 2.8.2. HFPW and HIFU Therapy Research Studies
- 2.9. Contraindications to High Frequency Ultrasound Therapy

#### Module 3. Electrotherapy and Analgesia

- 3.1. Definition of Pain. Concept of Nociception
  - 3.1.1. Definition of Pain
    - 3.1.1.1. Characteristics of Pain
    - 3.1.1.2. Other Concepts and Definitions Related to Pain
    - 3.1.1.3. Types of Pain
  - 3.1.2. Concept of Nociception
    - 3.1.2.1. Peripheral Part of the Nociceptive System
    - 3.1.2.2. Central Part of the Nociceptive System

- 3.2. Main Nociceptive Receptors
  - 3.2.1. Nociceptor Classification
    - 3.2.1.1. According to Driving Speed
    - 3.2.1.2. According to Location
    - 3.2.1.3. According to Stimulation Modality
  - 3.2.2. Functioning of Nociceptors
- 3.3. Main Nociceptive Pathways
  - 3.3.1. Basic Structure of the Nervous System
  - 3.3.2. Ascending Spinal Pathways
    - 3.3.2.1. Spinothalamic Tract (TET)
    - 3.3.2.2. Spinoreticular Tract (SRT)
    - 3.3.2.3. Spinomesencephalic Tract (SMT)
  - 3.3.3. Trigeminal Ascending Pathways
    - 3.3.3.1. Trigeminothalamic Tract or Trigeminal Lemniscus
  - 3.3.4. Sensitivity and Nerve Pathways
    - 3.3.4.1. Exteroceptive Sensitivity
    - 3.3.4.2. Proprioceptive Sensitivity
    - 3.3.4.3. Interoceptive Sensitivity
    - 3.3.4.4. Other Fascicles Related to Sensory Pathways

### tech 22 | Structure and Content

<ol><li>Transmitter Mechanisms of Nociceptive Rec</li></ol>	egulation
---	-----------

- 3.4.1. Transmission at the Spinal Cord Level (PHSC)
- 3.4.2. APME Neuron Characteristics
- 3.4.3. Redex Lamination
- 3.4.4. Biochemistry of Transmission at the PHSC Level
  - 3.4.4.1. Presynaptic and Postsynaptic Channels and Receptors
  - 3.4.4.2. Transmission at the Level of Ascending Spinal Tract
  - 3.4.4.3. Spinothalamic Tract (TET)
  - 3.4.4.4. Transmission at the Level of the Thalamus
  - 3.4.4.5. Ventral Posterior Nucleus (VPN)
  - 3.4.4.6. Medial Dorsal Nucleus (MDN)
  - 3.4.4.7. Intralaminar Nuclei
  - 3.4.4.8. Posterior Region
  - 3.4.4.9. Transmission at the Level of the Cerebral Cortex
  - 3.4.4.10. Primary Somatosensory Area (S1)
  - 3.4.4.11. Secondary Somatosensory or Association Area (S2)
- 3.4.5. Gate Control
  - 3.4.5.1. Modulation Segmental Level
  - 3.4.5.2. Suprasegmental Modulation
  - 3.4.5.3. Considerations
  - 3.4.5.4. Review of Gate Control Theory
- 3.4.6. Descending Routes
  - 3.4.6.1. Brainstem Modulatory Centers
  - 3.4.6.2. Diffuse Noxious Inhibitory Control (DNIC)
- 3.5. Modulating Effects of Electrotherapy
  - 3.5.1. Pain Modulation Levels
  - 3.5.2. Neuronal Plasticity
  - 3.5.3. Sensory Pathway Theory of Pain
  - 3.5.4. Electrotherapy Models
- 3.6. High Frequency and Analgesia
  - 3.6.1. Heat and Temperature
  - 3.6.2. Effects
  - 3.6.3. Application Techniques
  - 3.6.4. Dosage





## Structure and Content | 23 tech

- 3.7. Low Frequency and Analgesia
  - 3.7.1. Selective Stimulation
  - 3.7.2. TENS and Gate Control
  - 3.7.3. Post-Excitatory Depression of the Orthosympathetic Nervous System
  - 3.7.4. Theory of Endorphin Release
  - 3.7.5. TENS Dosage
- 3.8. Other Parameters Related to Analgesia
  - 3.8.1. Electrotherapy Effects
  - 3.8.2. Dosage in Electrotherapy

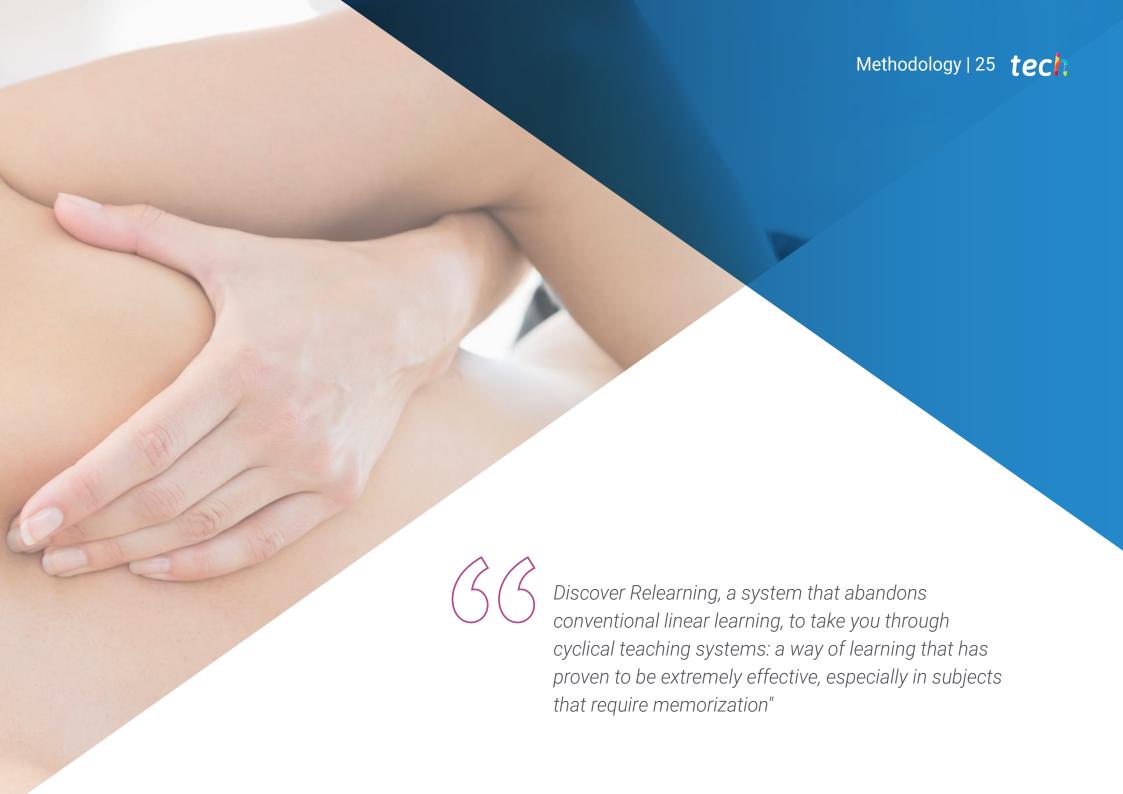


Do not miss the opportunity to update your physiotherapeutic practice with the best professionals and enroll now in this Postgraduate Diploma"



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.

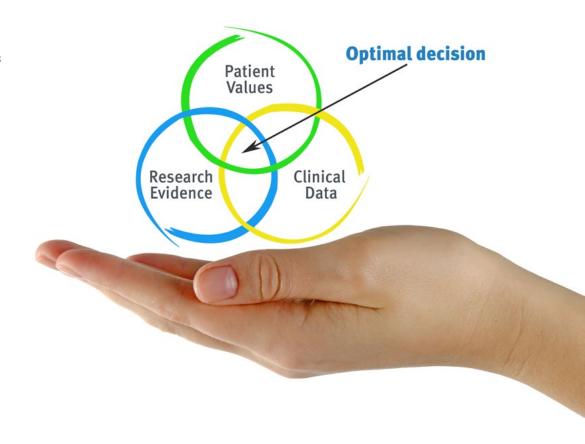


# tech 26 | Methodology

#### 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. Physiotherapists/kinesiologists 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 of professional physiotherapy 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. Physiotherapists/kinesiologists who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
- 2. The learning process has a clear focus on practical skills that allow the physiotherapist/kinesiologist 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.

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



### Methodology | 29 tech

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 we trained more than 65,000 physiotherapists/kinesiologists with unprecedented success in all clinical specialties, regardless of the workload. 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 training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for 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 our learning system is 8.01, according to the highest international standards.

# tech 30 | Methodology

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 really 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.



#### **Physiotherapy Techniques and Procedures on Video**

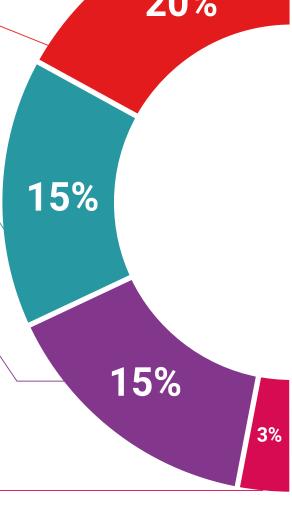
TECH brings students closer to the latest techniques, the latest educational advances and to the forefront of current Physiotherapy techniques and procedures. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch them as many times as you want.



#### **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 unique multimedia content presentation training system 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.

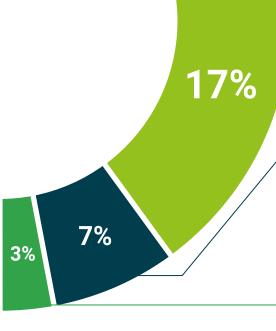
The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



#### **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.





20%





### tech 34 | Certificate

This **Postgraduate Diploma in Electrotherapy and Analgesia** contains the most complete and up-to-date scientific on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma** issued by **TECH Technological University** via tracked delivery\*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma,and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: Postgraduate Diploma in Electrotherapy and Analgesia
Official N° of Hours: **450 h.** 



<sup>\*</sup>Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

health confidence people
education information tutors
guarantee accreditation teaching
institutions technology learning



# Postgraduate Diploma Electrotherapy and Analgesia

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

