

# Postgraduate Certificate

Neurophysiological  
Techniques in the Diagnosis of  
Neuromuscular Diseases





## Postgraduate Certificate Neurophysiological Techniques in the Diagnosis of Neuromuscular Diseases

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

Website: [www.techtute.com/us/medicine/postgraduate-certificate/neurophysiological-techniques-diagnosis-neuromuscular-diseases](http://www.techtute.com/us/medicine/postgraduate-certificate/neurophysiological-techniques-diagnosis-neuromuscular-diseases)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Course Management

---

*p. 12*

04

Structure and Content

---

*p. 16*

05

Methodology

---

*p. 20*

06

Certificate

---

*p. 28*

# 01

# Introduction

The proper functioning of the nervous system is key to each and every one of the functions of our body. However, if we talk about muscular functioning, this importance grows exponentially. Accordingly, and thanks to the advances in diagnostic and therapeutic methods, clinical muscular neurophysiology has undergone significant developments in recent decades, requiring doctors capable of taking on the new challenges involved in diagnosing possible neurophysiological and neuromuscular pathologies. Therefore, this TECH program gives professionals the opportunity to refresh and update their knowledge in this exciting field with the aim of bringing the best methods and treatments to daily practice.





“

*Thanks to this Postgraduate Certificate, you will update your knowledge of neuromuscular disease diagnosis, becoming a crucial piece in any health service”*

Clinical neurophysiology adapted to muscle studies offers numerous advantages to patients, since it gives them the possibility of knowing how their nervous system affects muscle function and can trigger various pathologies. All this has meant that physicians from different specialties have been requesting different neurophysiological studies for their patients in recent years, not only because of the number of results they yield, but also because of the wide variety of pathological processes that can be evaluated.

This has led to an exponential increase in research in this field, adding new techniques that are more specific, useful and adapted to the needs of each case. However, there is a general lack of specialists to handle these new diagnostic procedures, which makes academic updating absolutely essential for anyone who wants to play a role in this field.

Therefore, this TECH Postgraduate Certificate addresses all these new techniques in order to refresh and update the knowledge of the entire diagnostic arsenal available to evaluate different neuromuscular structures. This will allow physicians to update their knowledge in a booming field that offers numerous professional and financial opportunities.

And all this will be achieved in a simple way in just six weeks of intensive online study, and with the certainty that comes from being able to learn from the best working professionals on the international scene. A luxury that only TECH, the world's largest Online University could offer.

This **Postgraduate Certificate in Neurophysiological Techniques in the Diagnosis of Neuromuscular Diseases** contains the most complete and up-to-date scientific program on the market. Its most notable features are:

- ♦ Practical case studies are presented by medical experts in Neurophysiology
- ♦ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- ♦ Practical exercises where self-assessment can be used to improve learning
- ♦ Its special emphasis on innovative methodologies in Pediatric Orthopedics
- ♦ 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



*The simplest and most basic human activities require proper muscle function. That is why it is crucial for physicians to continue to advance in this exciting area”*

“

*Enroll in this Postgraduate Certificate today and start to see the doors open to a promising professional future”*

The program's teaching staff includes professionals from the 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 specialization 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 throughout the program. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

*You deserve to grow and reach the top, that's why at TECH, we help you achieve precisely that.*

*With this program, you will learn to detect symptoms that denote a possible neuromuscular pathology, and, above all, you will learn to diagnose it from the best and most innovative methods.*



# 02 Objectives

Muscle function is basic to any person's state of health. Walking, standing or performing the most basic human functions greatly depend on the muscles. Aware of the significance of this, TECH has designed this Postgraduate Certificate that will give doctors the opportunity to learn to diagnose various neuromuscular pathologies from the most updated and innovative procedures and techniques in the field.







“

*Where do you see yourself a few months from now? Practicing as a high-level neurophysiological physician? If so, then this Postgraduate Certificate is ideal for you”*



## General Objectives

---

- Obtain a global and updated vision of neurophysiological diagnosis in its different training areas, allowing students to acquire useful and up-to-date knowledge and homogenize criteria following national and international standards
- Generate within the student the desire to broaden knowledge and apply what has been learned to daily practice, to the development of new diagnostic indications and to research.



*Place your trust in the most awarded academic methodology in the online teaching panorama, trust in TECH Technological University”*





## Specific Objectives

---

- ♦ Review the practical aspects and challenges of neurophysiological examinations: How to optimize equipment for different types of examinations?
- ♦ Delve into the different types of nerve conduction studies
- ♦ Understand the rationale and technique behind performing rare sensory and motor nerve conduction studies
- ♦ Become familiar with the physiological and non-physiological factors affecting the technical aspects of nerve conduction recording
- ♦ Learn the different technical aspects and clinical applications of specialized nerve conduction procedures, such as delayed responses and blink reflex
- ♦ Recognize normal and abnormal motor unit morphology and recruitment pattern
- ♦ Recognize the clinical utility of advanced EMG techniques
- ♦ Thoroughly understand the physiology and technical aspects underlying repetitive nerve stimulation (RNS) and *jitter studies*, single fiber and concentric needles, with hands-on demonstrations
- ♦ Ascertain how neuromuscular ultrasound complements conventional neurophysiologic assessment
- ♦ Use ultrasound for precise localization during botulinum toxin infiltration
- ♦ Review the evidence for instrumental guidance in muscle localization (EMG/ stimulation vs. ultrasound)

03

# Course Management

The most renowned professionals in the field of neuromuscular diseases participate in the design, development and teaching of this Postgraduate Certificate. Physicians who know the importance of early detection of neuromuscular pathologies, who know the best ways to make it happen and who have put all their knowledge at the service of students with a single objective: To graduate the best specialists in the field.



“

*TECH offers you a unique opportunity to learn from professionals of international stature that you would otherwise not be able to access”*

## Management



### Dr. Martínez Pérez, Francisco

- Clinical Neurophysiology Service. Puerto de Hierro University Hospital, Majadahonda
- Advanced neurophysiological studies at the MIP Health Clinic - Personalized Integrated Medicine
- Neurophysiology techniques applied at the Vitruvian Institute of Biomechanics and Surgery.
- Medical Specialist in Clinical Neurophysiology
- Degree in Medicine and Surgery from the Complutense University of Madrid
- Master's Degree in Sleep: Physiology and Pathology, Pablo Olavide University.
- Master's Degree in Neurological Electrodiagnosis by the University of Barcelona.
- Researcher, university lecturer, professor of the Master's Degree in Sleep Medicine.
- Author of several guidelines and consensuses for different medical societies (SENEFC, SES, AEP) and the National Commission of the Specialty.
- XXI Century National Prize in Medicine
- European Award in Medicine



## Professors

### Dr. López Gutiérrez, Inmaculada

- ♦ Head of the Clinical Neurophysiology Department, Rey Juan Carlos, Infanta Elena, General de Villalba and Jiménez Díaz Foundation Hospitals
- ♦ Degree in Medicine from the University of Granada
- ♦ Official Master's Degree in Neurosciences from the University of Seville
- ♦ Expert in Sleep Medicine by the Spanish Committee of Accreditation in Sleep Medicine (CEAMS).
- ♦ Somnologist - Postgraduate Diploma in Sleep Medicine, European Sleep Research Society (ESRS)
- ♦ Co-President of the Multidisciplinary Sleep Unit, Rey Juan Carlos University Hospital
- ♦ Member of the Spanish Andalusian Society of Clinical Neurophysiology
- ♦ Member of the Spanish Sleep Society and its Pediatric Working Group
- ♦ Member of the European Sleep Research Society

### Dr. Martínez Aparicio, Carmen

- ♦ Coordinator of the Clinical Neurophysiology Unit at Hospital Vithas, Almeria and FEA of Clinical Neurophysiology at Torrecárdenas University Hospital, Almeria
- ♦ Current president of the Andalusian Society of Clinical Neurophysiology (SANFC)
- ♦ Degree in Medicine and Surgery from the University of Granada
- ♦ Master's Degree in Sleep from the Pablo Olavide University
- ♦ Expert in Musculoskeletal Ultrasound Francisco de Vitoria University

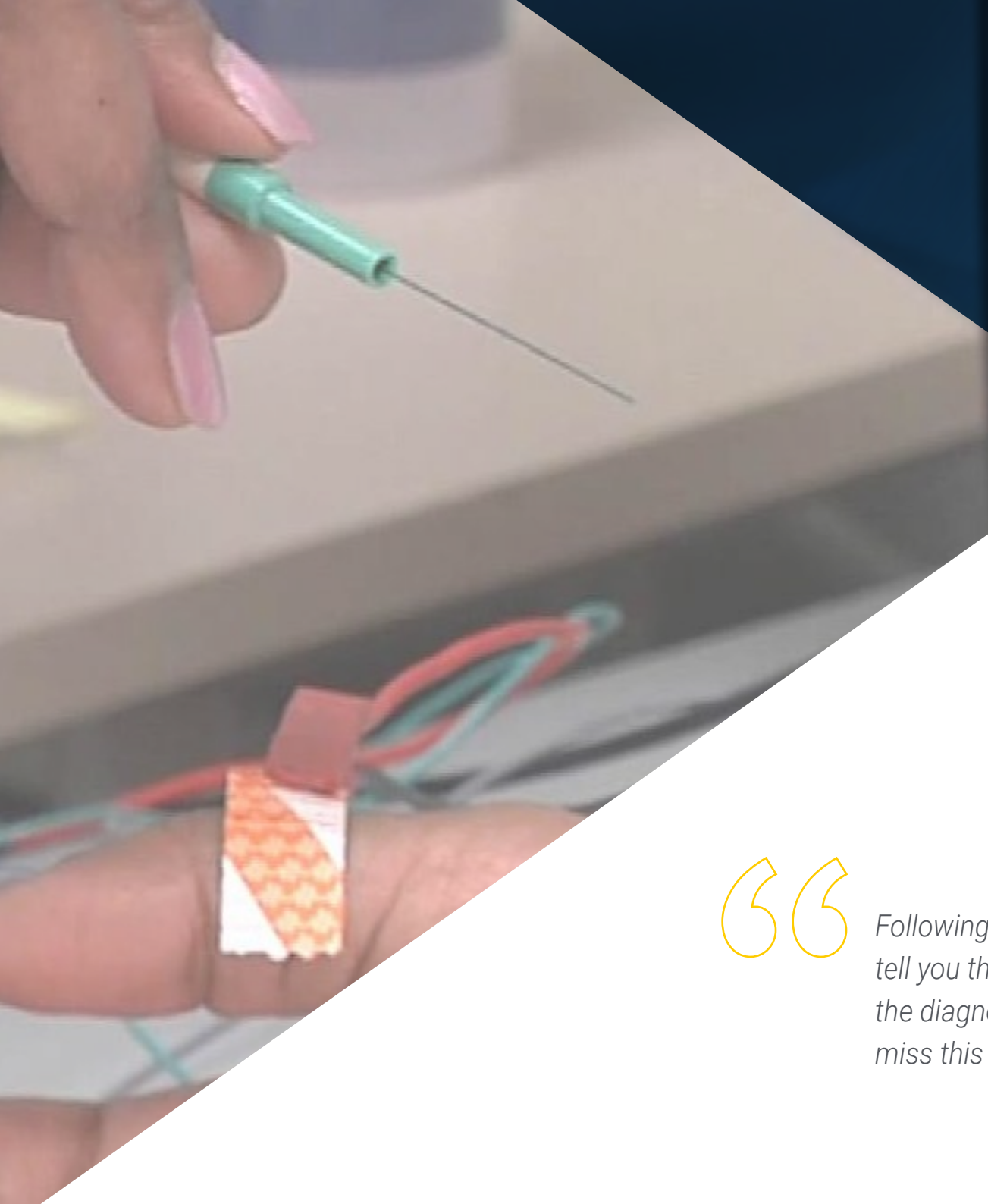
# 04

## Structure and Content

This Postgraduate Certificate has been designed to be taught entirely online, so that in only six weeks, students will internalize the basic and fundamental knowledge for the diagnosis and treatment of neuromuscular diseases. Therefore, this program is a unique opportunity within the reach of doctors who want to specialize without having to sacrifice the rest of their daily activities.







“

*Following the syllabus, the best professionals will tell you the secrets and the latest developments in the diagnosis of neuromuscular diseases. Do not miss this great opportunity”*

## Module 1. Neurophysiological Techniques in the Diagnosis of Neuromuscular Diseases

- 1.1. Anatomy and Physiology of the Peripheral Nervous System
- 1.2. Sensory and Motor Nerve Conduction Studies
- 1.3. Reflexology and Late Responses
  - 1.3.1. F Wave
  - 1.3.2. A Wave
  - 1.3.3. H Reflex
  - 1.3.4. T Reflex
- 1.4. Technical and Quality Considerations in Neuromuscular Electrodiagnosis: Procedural Errors Precautions
- 1.5. Neurophysiological Assessment of Neuromuscular Junction Function
  - 1.5.1. Repetitive Nerve Stimulation
  - 1.5.2. Jitter Study Using Single-Fiber Needles and Concentric Needles
    - 1.5.2.1. Voluntary Contraction
    - 1.5.2.2. Axonal Stimulation
- 1.6. Principles of Electromyography: Electromyographic Response in Normal Motor Units Insertion Activity Motor Plate Activity Motor Unit Potential Pathological Muscle Activity
- 1.7. Techniques for Quantitative Estimation of Motor Units
  - 1.7.1. MUNE
  - 1.7.2. MUNIX
  - 1.7.3. MUSIX
- 1.8. Neurophysiological Study of the Facial and Trigeminal Nerves
- 1.9. Neurophysiological Evaluation of the Respiratory System
  - 1.9.1. Laryngeal Nerves and Muscles
  - 1.9.2. Phrenic Nerve and Diaphragm Muscle





- 1.10. Neuromuscular Ultrasound
  - 1.10.1. Basic Neural Semiology and Physical Basis Adapted to Ultrasound Study
  - 1.10.2. Normal Anatomy and Ultrasound Correlation
    - 1.10.2.1. Upper Limbs
    - 1.10.2.2. Lower Extremities
  - 1.10.3. Ultrasound Scanning: Peripheral Nerves
    - 1.10.3.1. Upper Limbs
    - 1.10.3.2. Lower Extremities
  - 1.10.4. Ultrasound Diagnosis: Focal Neuropathies
    - 1.10.4.1. Upper Limbs
    - 1.10.4.2. Lower Extremities
  - 1.10.5. Advanced Imaging
  - 1.10.6. Percutaneous Interventional Techniques

“*Join the TECH family today and become one of the thousands of success stories to come out of this University: students like you who have achieved their goals and reached the heights they sought*”

# 05 Methodology

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

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



“

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

## At TECH, we use the Case Method

What should a professional do in a given situation? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

*With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.*



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the physician's professional practice.

“

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

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

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



## Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

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





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

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

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

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

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



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



#### Study Material

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

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



#### Surgical Techniques and Procedures on Video

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



#### Interactive Summaries

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

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



#### Additional Reading

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





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

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



#### Testing & Retesting

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



#### Classes

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



#### Quick Action Guides

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



# 06 Certificate

The Postgraduate Certificate in Neurophysiological Techniques in the Diagnosis of Neuromuscular Diseases guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University



“

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

This **Postgraduate Certificate in Neurophysiological Techniques in the Diagnosis of Neuromuscular Diseases** contains the most complete and up-to-date scientific program on the market.

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

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

Title: **Postgraduate Certificate in Neurophysiological Techniques in the Diagnosis of Neuromuscular Diseases**

Official Number of Hours: **150**



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



## Postgraduate Certificate

### Neurophysiological Techniques in the Diagnosis of Neuromuscular Diseases

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

# Postgraduate Certificate

Neurophysiological Techniques in  
the Diagnosis of Neuromuscular  
Diseases

