

# Postgraduate Certificate

Neurophysiological Techniques  
for Therapeutic Purposes. Invasive  
and Non-Invasive Neuromodulation.  
Botulinum Toxin





**Postgraduate Certificate**  
Neurophysiological  
Techniques for  
Therapeutic Purposes.  
Invasive and Non-Invasive  
Neuromodulation.  
Botulinum Toxin

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

Website: [www.techtute.com/in/medicine/postgraduate-certificate/neurophysiological-techniques-therapeutic-purposes-invasive-non-invasive-neuromodulation](http://www.techtute.com/in/medicine/postgraduate-certificate/neurophysiological-techniques-therapeutic-purposes-invasive-non-invasive-neuromodulation)

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# 01

# Introduction

The neurophysiological therapeutic field has seen increasing progress in recent years, with different groups of researchers and practitioners from various specialities discovering new ways to apply therapies to patients with pathologies ranging from chronic pain to OSA. Given the variety of applications of invasive and non-invasive procedures, it is important for the physician to be aware of the wide-ranging possibilities of the most prevalent neuromodulation techniques. This TECH program gathers all this knowledge in a clear and orderly syllabus, prepared by the best professionals in order to provide students with the perfect opportunity for professional growth.





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*Treat ailments such as fibromyalgia or chronic pain with the latest neurophysiological techniques, becoming the best practitioner in your area"*

The management of pathologies such as drug-resistant chronic pain, epilepsy, fibromyalgia or even depression can benefit from the appropriate use of neurophysiological therapies. Throughout this course, the student will learn about the latest advances in this field and how to apply the different types of neuromodulation techniques to different ailments.

Thus, students will gain extensive knowledge of neurophysiological therapies, a speciality that will undoubtedly be of great use in their medical career, as it will allow them to treat various common pathologies more effectively.

An awareness of the continuous advances made in neurophysiological therapies will also provide the student with significant scope for growth within their area of healthcare.

All this in a completely online Postgraduate Certificate, where the student can download the entire syllabus from the first day of teaching. This, together with the absence of classes and fixed schedules, makes it possible for the student to decide when to assume the entire study load, without abandoning their current work or personal commitments.

This **Postgraduate Certificate in Neurophysiological Techniques for Therapeutic Purposes. Invasive and Non-Invasive Neuromodulation. Botulinum Toxin** contains the most complete and up-to-date scientific program on the market. Its most notable features are:

- » Practical case studies presented by experts in Neurophysiology
- » Graphic, schematic, and practical contents which provide scientific and practical information on the disciplines that are essential for professional practice
- » Practical exercises where self-assessment can be undertaken to improve learning
- » A 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



*You are choosing the best academic institution, with professional and personalized support that you won't find in other programs"*

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*Don't waste your time and money on other titles that don't take you into consideration. At TECH you make all the important decisions, without sacrificing any aspect of your personal and work life"*

The program's teaching staff includes professionals from the sector who pour their professional experience into this 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 learning designed for real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to resolve the different professional practice situations that arise during the academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

*Neuromodulation will reveal all its secrets, as you learn how to use it effectively for each pathology.*

*Enroll today on this Postgraduate Certificate and boost your career prospects by gaining a reputation for excellent patient care.*



# 02 Objectives

The field of neurophysiological therapeutic techniques provides plenty of scope for professional growth, so TECH has focused its efforts in this program to educate students on all the most advanced issues so that they graduate from the Postgraduate Certificate as leading practitioners in this area. As a result, this program is the best possible way to achieve impressive career advancement in the field of neurophysiology.







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*Your patients will benefit greatly from having a professional like you, who is highly qualified in neurophysiological therapies”*



## General Objectives

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- » Obtain an up-to-date overview of neurophysiological diagnosis and its related areas, which allows the acquisition of useful and up-to-date expertise which is in line with international standards
- » Generate a desire to broaden knowledge and apply what has been learned to daily practice, for the development of new diagnostic techniques and related research



*You are just one step away from a profound change in your career path. Do not hesitate and learn about the most rigorous neurophysiological techniques"*





## Specific Objectives

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- » Gain a detailed understanding of the physiological theory behind the different invasive and non-invasive brain stimulation techniques
- » Explore the most common indications for the different invasive and non-invasive brain stimulation techniques
- » Acquire neurophysiological expertise on direct cortical stimulation and its specific indications in the treatment of drug-resistant chronic pain
- » Learn the protocols for the application of direct cortical stimulation in the treatment of drug-resistant chronic pain
- » Acquire neurophysiological expertise on spinal cord stimulation and its specific indications in the treatment of chronic pain and other applications
- » Learn the application protocols of spinal cord stimulation in the treatment of chronic pain
- » Get to know the role of neuromodulation in the treatment of epilepsy, as well as its diagnostic applications
- » Acquire neurophysiological expertise on brain stimulation for the diagnosis of epilepsy
- » Acquire neurophysiological expertise on brain stimulation for the treatment of epilepsy
- » Know the diagnostic indications of brain stimulation in epilepsy
- » Know the therapeutic indications of brain stimulation in epilepsy
- » Understand the role of deep brain stimulation (DBS) for Parkinson's disease (PD) and other movement disorders

- » Learn the physiological theory behind deep brain stimulation (DBS)
- » Learn about the techniques and clinical indications for DBS for Parkinson's disease and other movement disorders
- » Know the physiological concepts and effects of vagus nerve stimulation
- » Learn the techniques and clinical indications for vagus nerve stimulation
- » Know the effect of vagus nerve stimulation on patients diagnosed with epilepsy
- » Know the physiological concepts and effects of hypoglossal nerve stimulation
- » Learn the techniques and clinical indications for hypoglossal nerve stimulation
- » Know the effect of hypoglossal nerve stimulation in patients diagnosed with OSAS
- » Know the physiological theory and effects of stimulation of other peripheral nerves such as the trigeminal, occipital, tibial and sacral nerves
- » Learn the techniques and clinical indications for trigeminal, occipital, tibial and sacral nerve stimulation
- » Understand the fundamental theory on how hearing implants work
- » Know the types of hearing implants: cochlear and brainstem
- » Learn the indications for hearing implant implantation
- » Know the physiological principles of non-invasive brain stimulation
- » Learn about the types of non-invasive brain stimulation: direct transcranial electrical stimulation (TES) and transcranial magnetic stimulation (TMS)





- » Learn the indications for non-invasive brain stimulation
- » Know about the scientific findings supporting non-invasive brain stimulation and learn the most common therapeutic protocols
- » Know the fundamentals, the basis of operation and forms of *transcutaneous electrical nerve stimulation* (TENS)
- » Learn the indications, contraindications and effects of TENS
- » Know the action mechanism of botulinum toxin
- » Learn the therapeutic and adverse effects of botulinum toxin.
- » Use neurophysiological techniques to apply botulinum toxin for the treatment of in different dystonia such as cervical dystonia, blepharospasm, facial myokymias, oromandibular dystonia, upper extremity dystonia and trunk dystonia
- » Acquire theoretical knowledge (definitions, indications and implementation protocols), as well as practical experience in the implementation of personalized neuromodulation therapies for various clinical cases and following clinical protocols
- » Understand neuromodulation therapies as an adjuvant treatment working in conjunction with other treatments provided by a multidisciplinary team, and not as a stand-alone treatment

03

# Course Management

TECH has assembled a teaching faculty with expertise in the area of clinical neurophysiology, including experience leading these services in renowned hospitals. This guarantees not only that the student will receive a Postgraduate Certificate of the highest quality, but also that he or she will be taught by professionals who already know how to succeed in their careers and can pass on the keys to success in their healthcare field.



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*You will have the advice and counsel of professionals who already know what it's like to be at the helm of their own neurophysiology services”*

## 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 (SENFEC, SES, AEP) and the National Commission of the Specialty
- ♦ XXI Century National Prize in Medicine
- ♦ European Award in Medicine





## Professors

### Dr, Lladó Carbó, Estela

- » Head of Service of the Neurophysiology Unit of HM Hospitals Catalunya
- » Specialist, via MIR, in Clinical Neurophysiology at the Hospital Universitari Vall d'Hebrón.
- » Founder and Medical Director of Neurotoc
- » Degree in Medicine and Surgery from the University of Barcelona
- » Postgraduate Certificate in Neurosciences (DEA) by the University of Barcelona
- » V Postgraduate Certificate in Magnetic Stimulation and Neuromodulation by the University of Cordoba - Harvard Berenseon Allen Center

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*The leading professionals in the field have come together to offer you the most comprehensive knowledge in this subject, so that you can be assured of success"*

# 04

## Structure and Content

The teachers have made every effort to build a useful syllabus for students, where all the most recent and innovative neurophysiological therapeutic techniques are explained in an effective and straightforward way. In order to achieve this, the theory is supported by a wide range of audiovisual content, which also includes real clinical cases in which students can see the different techniques learned in a realistic context.





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*Thanks to TECH's advanced teaching methodology, you will learn all the complex therapeutic concepts of this program in a natural, simple and progressive way "*

**Module 1. Neurophysiological Techniques for Therapeutic Purposes. Invasive and Non-Invasive Neuromodulation. Botulinum Toxin**

- 1.1. Invasive Brain Stimulation: Physiological Background
  - 1.1.1. Definition and Physiological Background of Invasive Brain Stimulation (ICS)
  - 1.1.2. Current Main Indications
- 1.2. Direct Cortical and Medullary Stimulation
  - 1.2.1. Neurophysiological Basis of Direct Cortical Stimulation in the Treatment of Pain: Indications and Practical Examples
  - 1.2.2. Neurophysiological Basis of Spinal Cord Electrical Stimulation in the Treatment of Pain: Indications and Practical Examples
- 1.3. Neuromodulation in Epilepsy: Brain Stimulation for Diagnosis and Treatment
  - 1.3.1. Basis and Rationale of Neuromodulation for the Diagnosis of Epilepsy
  - 1.3.2. Neuromodulation Applied to the Treatment of Epilepsy: Indications and Practical Examples
- 1.4. Deep Brain Stimulation (DBS)
  - 1.4.1. Use of DBS in Parkinson's Disease (PD)
  - 1.4.2. How Does DBS Work?
  - 1.4.3. Clinical Indications for DBS in PD and Other Movement Disorders
- 1.5. Vagus Nerve Stimulation (VNS) and Hypoglossal Nerve Stimulation (VNS). Stimulation of Other Peripheral Nerves (Trigeminal, Tibial, Occipital, Sacral)
  - 1.5.1. Vagus Nerve Stimulation for the Treatment of Epilepsy and Other Indications
  - 1.5.2. Stimulation of the Hypoglossal Nerve for the Treatment of OSAHS
  - 1.5.3. Stimulation of Other Peripheral Nerves (Trigeminal, Occipital, Tibial and Sacral)
- 1.6. Hearing Implants
  - 1.6.1. Definition and Fundamentals of Hearing Implants
  - 1.6.2. Types of Hearing Implants: Cochlear and Brain Stem Implants
- 1.7. Non-Invasive Brain Stimulation (NIBS): Physiological Basis
  - 1.7.1. Physiological Basis of NIBS
  - 1.7.2. Types of NCTS: Transcranial Electrical Stimulation (TENS) and Transcranial Magnetic Stimulation (TMS)





- 1.8. Non-Invasive Brain Stimulation: Indications and Therapeutic Protocols
  - 1.8.1. Indications for NIBS
  - 1.8.2. Scientific Evidence and Therapeutic Protocols
- 1.9. TENS
  - 1.9.1. Definition, Action Mechanism and Forms
  - 1.9.2. Indications, Contraindications and Effects
- 1.10. Neurophysiological Techniques for Botulinum Toxin Infiltration
  - 1.10.1. Botulinum Toxin: Therapeutic and Adverse Effects
  - 1.10.2. Botulinum Toxin Use: Cervical Dystonia, Blepharospasm, Facial Myokymia, Oromandibular Dystonia, Upper Limb and Trunk Dystonia
  - 1.10.3. Case Studies

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*Obtain your Postgraduate Certificate in Neurophysiological Techniques for Therapeutic Purposes. Invasive and Non-Invasive Neuromodulation. Botulinum Toxin in a straightforward way, without the need to spend dozens of hours on a final project”*

# 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.



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*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.



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

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

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



## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

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



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

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

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

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

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



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



#### Study Material

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

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



#### Surgical Techniques and Procedures on Video

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



#### Interactive Summaries

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

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



#### Additional Reading

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





**Expert-Led Case Studies and Case Analysis**

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



**Testing & Retesting**

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



**Classes**

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



**Quick Action Guides**

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



# 06 Certificate

This Postgraduate Certificate in Neurophysiological Techniques for Therapeutic Purposes. Invasive and Non-Invasive Neuromodulation. Botulinum Toxin guarantees you, in addition to the most rigorous and updated training, access to a Postgraduate Certificate issued by TECH Technological University.



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*Successfully complete this program  
and receive your university degree  
without travel or laborious paperwork”*

This **Postgraduate Certificate in Neurophysiological Techniques for Therapeutic Purposes. Invasive and Non-Invasive Neuromodulation. Botulinum Toxin** contains the most complete and up-to-date scientific program on the market."

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

The certificate 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 for Therapeutic Purposes. Invasive and Non-Invasive Neuromodulation. Botulinum Toxin**  
Official N° of hours: **150 h.**



\*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.



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## Postgraduate Certificate

Neurophysiological

Techniques for

Therapeutic Purposes.

Invasive and Non-Invasive

Neuromodulation.

Botulinum Toxin

personalized service

innovation

knowledge

present

quality

development

languages

virtual

classroom

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