

Postgraduate Diploma Electrical Stimulation and Interferential Currents in Physical Activity and Sport

Endorsed by the NBA





Postgraduate Diploma Electrical Stimulation and Interferential Currents in Physical Activity and Sport

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

Website: www.techtitute.com/us/sports-science/postgraduate-diploma/postgraduate-diploma-electrical-stimulation-interferential-currents-physical-activity-sport

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01

Introduction

Electrical stimulation and interference currents are techniques that can be used by sports professionals to achieve an adequate therapeutic action to improve their condition by applying low-intensity stimulation to the skin. If you want to know the benefits that these techniques can bring to your daily practice, do not hesitate and join our community of students.





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Learn how to apply electrical stimulation and interferential currents in athletes and improve their recovery capacity with these novel techniques”

At TECH we provide you with the most complete information on electrical stimulation and interferential currents in physical activity and sports so that you will enable you with a superior program that will allow you to apply these innovative techniques to your daily practice, achieving better recoveries in the users of your practice.

Electrical stimulation and interferential currents are used at low intensity on the skin of injured athletes to produce a therapeutic stimulation that reduces or eliminates local pain in athletes. In recent years, the number of research studies related to electrotherapy and the different techniques in this field has grown. These include percutaneous analgesic techniques in which needles are used as electrodes as well as transcranial stimulation, either of an electrical nature or by using magnetic fields. Based on latter application, the field of action of electrotherapy has been widened and can thereby be applied to various types of patients, ranging from subjects with chronic pain to neurological patients.

One of the main advantages of this program is that, since it is 100% online, it is the student who decides where and when to study. Without having to face any kind of limitation, either in terms of time or travel to a physical location. All this, with the intention of facilitating to the maximum the possibility of study for professionals who must combine their training with the rest of their daily obligations.

This **Postgraduate Diploma in Electrical Stimulation and Interferential Currents 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 case studies presented by experts in electrotherapy
- ♦ The graphic, schematic, and practical contents of which they are composed provide scientific and practical information on the disciplines that are essential for professional practice
- ♦ News on the role of the sports science professional in the application of electrotherapy
- ♦ Practical exercises where the self-assessment process can be carried out to improve learning
- ♦ Algorithm-based interactive learning system for decision-making in the situations that are presented to the student
- ♦ Its special emphasis on research methodologies on electrotherapy applied to sports sciences
- ♦ 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



Immerse yourself in the study of this high-level Postgraduate Diploma and improve your skills as a sports professional"

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This Postgraduate Diploma is the best investment you can make in the selection of a refresher program for two reasons: in addition to updating your knowledge in electrotherapy, you will obtain a Postgraduate Diploma from the leading online university in Spanish: TECH”

This Postgraduate Diploma offers training in simulated environments, which provides an immersive learning experience designed to train for real-life situations.

This 100% online Postgraduate Diploma will allow you to balance your studies with your professional work while increasing your knowledge in this field.

The teaching staff includes professionals from the field of sports science, who bring their 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 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 throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system developed by renowned and experienced experts in electrical stimulation and interferential currents.



02 Objectives

The Postgraduate Diploma in Electrical Stimulation and Interferential Currents in Physical Activity and Sport is designed to help the sports science professionals in their daily practice in situations where the application of electrotherapy is necessary.





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This Postgraduate Diploma is designed for you to update your knowledge in electrotherapy, with the use of the latest educational technology, to contribute with quality and safety to the decision making in this new field”



General Objectives

- Update the knowledge of sports science professionals in the field of electrotherapy
- Promote work strategies based on a comprehensive approach to the patient as a standard model for achieving excellent care
- Encourage the acquisition of technical skills and abilities, through a powerful audio-visual system, and the possibility of development through online simulation workshops and/or specific training
- Encourage professional stimulation through continuing education and research





Specific Objectives

- ♦ Broaden your knowledge of new high frequency applications in the rehabilitation of neuromusculoskeletal pathologies
- ♦ Broaden your knowledge of new applications of ultrasound therapy in the rehabilitation of neuromusculoskeletal pathologies
- ♦ Broaden your knowledge of new applications of electromagnetic laser radiation in the rehabilitation of neuromusculoskeletal pathologies

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The sports field requires prepared professionals and we give you the keys to position yourself among the professional elite"

03

Course Management

Our team of teachers, experts in electrotherapy, has a wide prestige in the profession and are professionals with years of teaching experience who have come together to help you give a boost to your profession. To this end, they have developed this Postgraduate Diploma with the latest developments in the field that will allow you to train and increase your skills in this sector.





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*Learn from the best professionals
and become a successful
professional yourself”*

Management



Dr. León Hernández, José Vicente

- Doctorate in Physiotherapy 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
- Master's Degree in the Study and Treatment of Pain from the Rey Juan Carlos University

Coordinators

Dr. Suso Martí, Luis

- Physiotherapy Degree:
- Master's Degree in "Advanced Physiotherapy in Pain Management"
- Doctoral candidate

Dr. Cuenca Martínez, Ferrán

- Physiotherapy Degree:
- Master's Degree in "Advanced Physiotherapy in Pain Management"
- Doctoral candidate

Dr. Gurdíel Álvarez, Francisco

- Physiotherapy Degree:
- Expert in Orthopedic Manual Therapy and Myofascial Pain Syndrome
- Professional Master's Degree in Advanced Physiotherapy in Musculoskeletal Pain Management

Dr. Merayo Fernández, Lucía

- Degree in Physiotherapy
- Professional Master's Degree in Advanced Physiotherapy in Musculoskeletal Pain Management

Dr. Losana Ferrer, Alejandro

- ◆ Physiotherapist
- ◆ Professional Master's Degree in Advanced Physiotherapy in Musculoskeletal Pain Management
- ◆ Expert in Neuro-Orthopedic Manual Therapy
- ◆ University Advanced Training in Therapeutic Exercise and Invasive Physiotherapy for Musculoskeletal Pain

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Our teaching team will provide you with all their knowledge so that you are up to date with the latest information on the subject”



04

Structure and Content

The structure of the contents has been designed by a team of professionals from the best centers and universities in the country, aware of the relevance of current training to be able to intervene in situations that require the use of electrotherapy, and committed to quality teaching through new educational technologies.





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We have the most complete and up-to-date academic program in the market. We want to put at your disposal the best training”

Module 1. Transcutaneous Electrical Stimulation (TENS)

- 1.1. Fundamentals of Current Type used in TENS
 - 1.1.1. Introduction
 - 1.1.1.1. Theoretical Framework: Neurophysiology of Pain
 - 1.1.1.1.1. Introduction and Classification of Nociceptive Fibers
 - 1.1.1.1.2. Characteristics of Nociceptive Fibers
 - 1.1.1.1.3. Stages of the Nociceptive Process
 - 1.1.2. Anti-Nociceptive System: Gate Theory
 - 1.1.2.1. Introduction to Current Type used in TENS
 - 1.1.2.2. Basic Characteristics of TENS Type of Current (Pulse Shape, Duration, Frequency and Intensity)
- 1.2. Classification of Current Type used in TENS
 - 1.2.1. Introduction
 - 1.2.1.1. Types of Electrical Current Classification
 - 1.2.1.2. According to Frequency (Number of Pulses Emitted per Second)
 - 1.2.2. Classification of Current Type used in TENS
 - 1.2.2.1. Conventional TENS
 - 1.2.2.2. TENS-Acupuncture
 - 1.2.2.3. Low-Rate Burst TENS
 - 1.2.2.4. Brief or Intense TENS
 - 1.2.3. Mechanisms of Action of the TENS Current Type
- 1.3. High Frequency TENS Analgesic Stimulation
 - 1.3.1. Neurophysiology of Nerve Cells
 - 1.3.2. Electrical Potential and Neurotransmission
 - 1.3.3. Ionic Concentrations and Equilibrium Potential
 - 1.3.4. All-or-Nothing Law
 - 1.3.5. Refractory Period
 - 1.3.6. Specificity and Transduction
 - 1.3.7. Sensory Receptors
 - 1.3.8. Accommodation



- 1.4. Analgesic Effects of High-Frequency TENS
 - 1.4.1. Introduction
 - 1.4.1.1. Main Reasons for the Wide Clinical Application of Conventional TENS
 - 1.4.2. Hypoalgesia Derived from Conventional/High Frequency TENS
 - 1.4.2.1. Mechanism of Action
 - 1.4.3. Neurophysiology of Conventional TENS
 - 1.4.3.1. Gate Control
 - 1.4.3.2. The Metaphor
 - 1.4.4. Failure to Achieve Analgesic Effects
 - 1.4.4.1. Main Mistakes
 - 1.4.4.2. Main Problem of Hypoalgesia by Conventional TENS
- 1.5. Analgesic Effects of Low-Frequency TENS
 - 1.5.1. Introduction
 - 1.5.2. Mechanisms of Action of TENS-mediated Hypoalgesia Acupuncture: Endogenous Opioid System
 - 1.5.3. Mechanism of Action
 - 1.5.4. High-Intensity and Low-Frequency
 - 1.5.4.1. Parameters
 - 1.5.4.2. Fundamental Differences from Conventional TENS Current
- 1.6. Analgesic Effects of “Burst-Type TENS”
 - 1.6.1. Introduction
 - 1.6.2. Description
 - 1.6.2.1. “Burst-Type TENS Current Details”
 - 1.6.2.2. Physical Parameters
 - 1.6.2.3. Sjölund and Eriksson
 - 1.6.3. Summary so far of the Physiological Mechanisms of both Central and Peripheral Analgesia
- 1.7. Importance of Pulse Width
 - 1.7.1. Introduction
 - 1.7.1.1. Physical Characteristics of Waves
 - 1.7.1.1.1. Waves Definition
 - 1.7.1.1.2. Other General Characteristics and Properties of a Wave
 - 1.7.2. Impulse Shape

- 1.8. Electrodes. Types and Application
 - 1.8.1. Introduction
 - 1.8.1.1. The TENS Current Device
 - 1.8.2. Electrodes
 - 1.8.2.1. General Characteristics
 - 1.8.2.2. Skin Care
 - 1.8.2.3. Other Types of Electrodes
- 1.9. Practical Applications
 - 1.9.1. TENS Applications
 - 1.9.2. Impulse Duration
 - 1.9.3. Impulse Shape
 - 1.9.4. Intensity
 - 1.9.5. Frequency (F)
 - 1.9.6. Electrode Type and Placement
- 1.10. Contraindications
 - 1.10.1. Contraindications to the use of TENS Therapy
 - 1.10.2. Recommendations for Safe TENS Practice

Module 2. Interferential Currents

- 2.1. Fundamentals of Interferential Currents
 - 2.1.1. Interferential Current Concept
 - 2.1.2. Main Properties of Interferential Currents
 - 2.1.3. Characteristics and Effects of Interferential Currents
- 2.2. Main Parameters of Interferential Currents
 - 2.2.1. Introduction to the Different Parameters
 - 2.2.2. Types of Frequencies and Effects Produced
 - 2.2.3. Relevance of Application Time
 - 2.2.4. Types of Applications and Parameters
- 2.3. Effects of High Frequency
 - 2.3.1. Concept of High Frequency in Interferential Streams
 - 2.3.2. Main Effects of High Frequency
 - 2.3.3. Application of High Frequency

- 2.4. Effects of Low Frequency
 - 2.4.1. Low-Frequency Concept in Interferential Currents
 - 2.4.2. Main Effects of Low Frequency
 - 2.4.3. Low-Frequency Application
- 2.5. Accommodation Concept Importance of the Frequency Spectrum
 - 2.5.1. Accommodation Concept
 - 2.5.2. Practical Relevance of Accommodation
 - 2.5.3. Accommodation and Frequency Spectrum. Importance of the Same
- 2.6. Frequency Spectrum Adjustments
 - 2.6.1. Frequency Spectrum Concept
 - 2.6.2. Frequency Spectrum Parameters
 - 2.6.3. Frequency Spectrum Adjustment Types
 - 2.6.4. Application of the Adjustment of Frequency Spectrum
- 2.7. Electrodes. Types and Application
 - 2.7.1. Main Types of Electrodes in Interferential Currents
 - 2.7.2. Relevance of Electrode Types in Interferential Currents
 - 2.7.3. Application of Different Types of Electrodes
- 2.8. Practical Applications
 - 2.8.1. Recommendations for the Application of Interferential Currents
 - 2.8.2. Techniques for the Application of Interferential Currents
- 2.9. Contraindications
 - 2.9.1. Contraindications to the Use of Interferential Currents
 - 2.9.2. Recommendations for Safe Practice Using Interferential Currents

Module 3. Invasive Current Application

- 3.1. Invasive Treatment in Physical Therapy for Analgesic Purposes
 - 3.1.1. General Aspects
 - 3.1.2. Types of Invasive Treatment
 - 3.1.3. Infiltration Versus Puncture
- 3.2. Fundamentals of Dry Needling
 - 3.2.1. Myofascial Pain Syndrome
 - 3.2.2. Myofascial Trigger Points
 - 3.2.3. Neurophysiology of Myofascial Pain Syndrome and Trigger Points

- 3.3. Post-puncture Treatments
 - 3.3.1. Adverse Effects of Dry Needling
 - 3.3.2. Post-puncture Treatments
 - 3.3.3. Combination of Dry Needling and TENS
- 3.4. Electrotherapy as an Adjunct to Dry Needling
 - 3.4.1. Non-Invasive Approach
 - 3.4.2. Invasive Approach
 - 3.4.3. Types of Electropuncture
- 3.5. Percutaneous Electrical Nerve Stimulation: PENS
 - 3.5.1. Neurophysiological Fundamentals of PENS Application
 - 3.5.2. Scientific Evidence for the Application of PENS
 - 3.5.3. General Considerations for PENS Implementation
- 3.6. Advantages of PENS Over TENS
 - 3.6.1. Current Status of PENS Implementation
 - 3.6.2. Application of PENS in Lower Back Pain
 - 3.6.3. Application of PENS in Other Regions and Pathologies
- 3.7. Use of Electrodes
 - 3.7.1. General Information on the Application of Electrodes
 - 3.7.2. Variations in the Application from of Electrodes
 - 3.7.3. Multipole Application
- 3.8. Practical Applications
 - 3.8.1. Justification for the Implementation of the PENS
 - 3.8.2. Applications in Lower Back Pain
 - 3.8.3. Upper Quadrant and Lower Limb Applications
- 3.9. Contraindications
 - 3.9.1. Contraindications Derived from TENS
 - 3.9.2. Contraindications Derived from Dry Needling
 - 3.9.3. General Considerations

- 3.10. Invasive Treatments for Regenerative Purposes
 - 3.10.1. Introduction
 - 3.10.1.1. Electrolysis Concept
 - 3.10.2. Intratissue Percutaneous Electrolysis
 - 3.10.2.1. Concept
 - 3.10.2.2. Effects
 - 3.10.2.3. State-of-the-Art Review
 - 3.10.2.4. Combination with Eccentric Exercises
- 3.11. Physical Principles of Galvanism
 - 3.11.1. Introduction
 - 3.11.1.1. Physical Characteristics of Direct Current
 - 3.11.2. Galvanic Current
 - 3.11.2.1. Physical Characteristics of Galvanic Current
 - 3.11.2.2. Chemical Phenomena of Galvanic Current
 - 3.11.2.3. Structure. BORRAR
 - 3.11.3. Iontophoresis
 - 3.11.3.1. Leduc's Experiment
 - 3.11.3.2. Physical Properties of Iontophoresis
- 3.12. Physiological Effects of Galvanic Current
 - 3.12.1. Physiological Effects of Galvanic Current
 - 3.12.2. Electrochemical Effects
 - 3.12.2.1. Chemical Behavior
 - 3.12.3. Electrothermal Effects
 - 3.12.4. Electrophysical Effects
- 3.13. Therapeutic Effects of Galvanic Current
 - 3.13.1. Clinical Application of Galvanic Current
 - 3.13.1.1. Vasomotor Action
 - 3.13.1.2. Effect on the Nervous System
 - 3.13.2. Therapeutic Effects of Iontophoresis
 - 3.13.2.1. Penetration and Elimination of Cations and Anions
 - 3.13.2.2. Drugs and Indications
 - 3.13.3. Therapeutic Effects of Intratissue Percutaneous Electrolysis
- 3.14. Types of Percutaneous Application of Galvanic Currents
 - 3.14.1. Introduction to Application Techniques
 - 3.14.1.1. Classification According to Electrode Placement
 - 3.14.1.1.1. Direct Galvanizing
 - 3.14.1.1.2. Indirect Galvanizing
 - 3.14.2. Classification According to the Technique Applied
 - 3.14.2.1. Intratissue Percutaneous Electrolysis
 - 3.14.2.2. Iontophoresis
 - 3.14.2.3. Galvanic Bath
- 3.15. Application Protocols
 - 3.15.1. Galvanic Current Application Protocols
 - 3.15.2. Intratissue Percutaneous Electrolysis Application Protocols
 - 3.15.2.1. Procedure
 - 3.15.3. Iontophoresis Application Protocols
 - 3.15.3.1. Procedure
- 3.16. Contraindications
 - 3.16.1. Contraindications of Galvanic Current
 - 3.16.2. Contraindications, Complications and Precautions of Galvanic Current



A unique, key, and decisive educational experience to boost your professional development”

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"

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

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At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"



You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.



The student will learn to solve complex situations in real business environments through collaborative activities and real cases.

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

“*Our program prepares you to face new challenges in uncertain environments and achieve success in your career”*

The case method is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question we face in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

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.

In 2019, we obtained the best learning results of all online universities in the world.

At TECH, you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



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.

With this methodology, we have trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, markets, and financial instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

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.

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.



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.



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 in future difficult decisions.



Practising Skills and Abilities

They will carry out activities to develop specific competencies and skills in each thematic area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



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.





Case Studies

Students will complete a selection of the best case studies chosen specifically for this situation. Cases that are presented, analyzed, and supervised by the best specialists in the world.



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".



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.



06 Certificate

The Postgraduate Diploma in Electrical Stimulation and Interferential Currents in Physical Activity and Sport guarantees, in addition to the most rigorous and up-to-date program, access to a Postgraduate Diploma issued by TECH Technological University.





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

This **Postgraduate Diploma in Electrical Stimulation and Interferential Currents in Physical Activity and Sport** contains the most complete and up-to-date scientific program on the market.

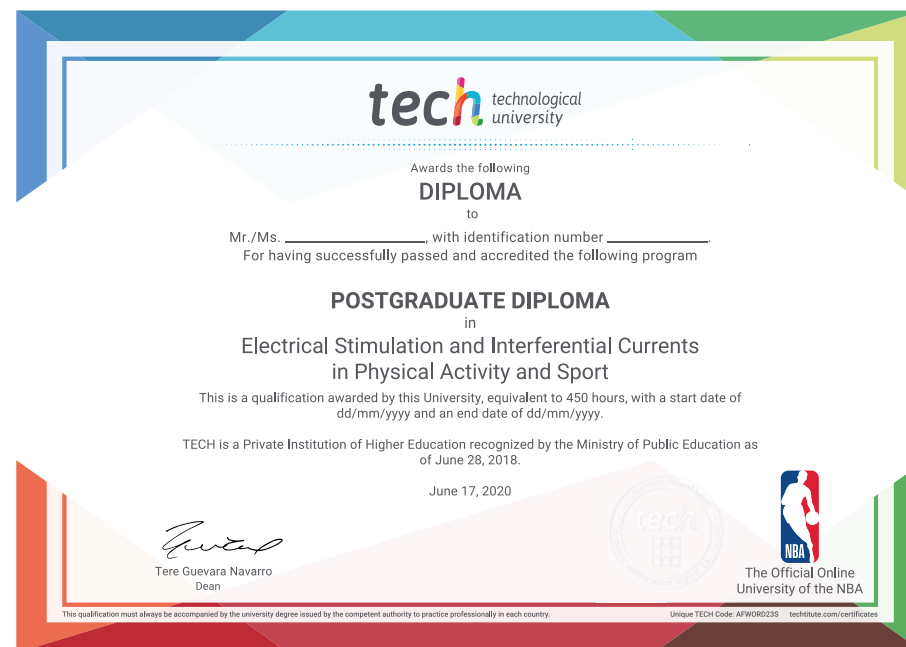
After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma** issued by **TECH Technological University** via tracked delivery*.

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

Title: **Postgraduate Diploma in Electrical Stimulation and Interferential Currents in Physical Activity and Sport**

Official Nº of Hours: **450 h.**

Endorsed by the NBA



*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.

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



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