

# Postgraduate Diploma

## Biomechanics and Voice Evaluation in Medicine





## Postgraduate Diploma Biomechanics and Voice Evaluation in Medicine

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

Website: [www.techtute.com/us/medicine/postgraduate-diploma/postgraduate-diploma-biomechanics-voice-evaluation-medicine](http://www.techtute.com/us/medicine/postgraduate-diploma/postgraduate-diploma-biomechanics-voice-evaluation-medicine)

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# 01

# Introduction

Acquiring the necessary skills to guide, address or treat the rehabilitation of the vocal system requires professionals to have anatomical and functional knowledge of it. Furthermore, professionals need a profound understanding of the different contexts in which the voice requires prior attention, support and regular accompaniment and a curative or palliative intervention a posteriori. In this training we offer you the opportunity to achieve all these competences in the most optimal product on the teaching market.

*Learn about the latest advances in biomechanics and voice evaluation and acquire the essential skills for the new professional landscape.*



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*This Postgraduate Diploma in Biomechanics and Voice Evaluation in Medicine will give you a sense of confidence in professional practice, which will help you grow both personally and professionally”*

Broadcasters, journalists, sales representatives, announcers, actors, singers, etc., require knowledge and management of their phonatory apparatus since its use is essential for their work. In this sense, it is also important to know the multifactorial nature of the voice and its alterations. The changes that occur in the human voice over time are related, among other factors, to the maturation and development of the phonorespiratory system, as well as to its deterioration. Another type of change is due to sex-related differences. There are also modifications in the voice due to professional use and to structural and functional alterations associated or not with other pathologies. And all of this is evident in both the normal voice and the pathological voice.

For all these reasons, knowledge on using one's own voice, programs for preventing disorders and Biomechanics and Voice Evaluation in Medicine as applied to the use in different contexts, are crucial elements in the health, well-being and development of any speaker.

This type of training makes professionals in this field increase their ability to succeed, which results in better practice and performance that will have a direct impact on their professional work, both in the teaching field and in the field of professional communication.

These studies can facilitate access to employment in this field given the existing lack of such professionals in this complex field of Biomechanics and Voice Evaluation.

This program offers a very broad view of vocal pathology and voice physiology, with examples of successful cases. It includes all the necessary and basic techniques for the preparation and re-education of the voice, taking into account the professions that use it as their main working tool, providing tools, experiences and advances in this field, which have also been guaranteed by the teaching staff on the course, since all of them work in the field. Professionals will learn based on professional experience as well as evidence-based pedagogy, which makes student training more effective and accurate.

This **Postgraduate Diploma in Biomechanics and Voice Evaluation in Medicine** is the most complete and up-to-date scientific program on the market. The most important features of the program include:

- ♦ More than 75 practical cases presented by experts in the teaching through e-learning.
- ♦ The graphic, schematic, and eminently practical contents with which they are created provide scientific and practical information on the disciplines that are essential for professional practice
- ♦ The latest developments in detection and intervention through e-learning applications in teaching.
- ♦ It contains practical exercises where the self-evaluation process can be carried out to improve learning.
- ♦ Algorithm-based interactive learning system for decision-making in the situations which are presented to the student.
- ♦ With special emphasis on evidence-based methodologies in e-learning applications in teaching.
- ♦ All this will be complemented by 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.



*Update your knowledge through the Postgraduate Diploma in Biomechanics and Voice Evaluation in Medicine"*





*A training created to be versatile and flexible, allowing you to balance your personal or professional life with the best online training”*

The teaching staff is made up of professionals belonging to the field of Biomechanics and Voice Evaluation in Medicine, who contribute their work experience to this training, as well as renowned specialists belonging to prestigious reference societies and 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 an immersive training program to train in real situations.

This program is designed around Problem Based Learning, whereby the student must try to solve the different professional practice situations that arise during the course. For this purpose, professionals will be assisted by an innovative, interactive video system created by renowned and experienced experts in the field of Speech Therapy with extensive teaching experience.

*With a didactic approach based on solving real situations, you will be trained quickly and efficiently, being able to immediately put each lesson into your daily practice with total confidence.*

*Join the pioneers in this area of work with competitive training in terms of quality and prestige: a unique opportunity to distinguish yourself as a professional.*



02

# Objectives

The Postgraduate Diploma in Biomechanics and Voice Evaluation in Medicine will allow you to acquire the necessary tools and skills to understand the voice in all its facets, giving you a professional boost.







*The Postgraduate Diploma is designed for you to update your knowledge in vocal therapy and apply it to professional practice with total confidence”*



## General Objective

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- Learn the specific anatomical and functional aspects of the phonatory system as a basis for the rehabilitation of vocal pathologies and for vocal work with voice professionals
- Gain in-depth knowledge of the most current diagnostic and treatment techniques
- Delve into the knowledge and analysis of the results obtained in objective voice assessments
- Learn how to implement a correct and thorough assessment of vocal function in daily clinical practice
- Know the most important features of the voice and learn to listen to different types of voices in order to know which aspects are altered to guide clinical practice
- Analyze the different possible vocal pathologies and achieve scientific rigor in treatments
- Learn about different approaches to the treatment of vocal pathologies
- Raise awareness of the need for vocal care
- Teach vocal therapy work focused on different voice professionals
- Learn the importance of multidisciplinary work in some voice pathologies
- View the voice as a global ability of the person and not as an exclusive act of the phonatory system
- Solve real case studies with current therapeutic approaches based on scientific evidence



## Specific Objectives

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- Learn about the phylogenetic origin of the phonatory system
- Learn about the evolutionary development of the human larynx
- Learn the main muscles and the functioning of the respiratory system
- Learn about the main anatomical structures that make up the larynx and how they function
- Learn the histology of the vocal cords
- Analyze the vibratory cycle of the vocal chords
- Analyze the different structures and cavities that form the vocal tract
- Study the different theories that have given answers to how voice is produced
- Study the characteristics of phonatory physiology and its main components
- Gain in-depth knowledge of the different exploratory tests used in the morphofunctional exploration of the larynx
- Learn the instruments needed to perform a morphofunctional assessment of the phonatory system
- Analyze and understand the results obtained with objective screening tests
- Learn in which cases the performance of such objective tests is indicated or not
- Learn concepts of speech acoustics
- Learn the different observable parameters in a spectrogram
- Learn how to analyze a spectrogram
- Know how to collect voice samples for acoustic analysis



- Interpret results obtained in the acoustic analysis of the voice
- Optimally use different acoustic analysis programs
- Learn to listen to different types of voices with objective criteria
- Apply different audio-perceptual scales in daily practice
- Learn about the different existing vocal function assessment tests
- Know the concept of fundamental frequency and learn how to obtain it from a speech sample
- Know the phonetogram and learn to use it in daily practice
- Calculate vocal functionality indexes
- Perform a complete anamnesis based on the patient's characteristics
- Learn about additional tests that can guide us in our treatment

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*Seize the opportunity and take the step to get up to date on the latest developments in Biomechanics and Voice Evaluation in Medicine”*

# 03

# Course Management

The program includes in its teaching staff renowned experts in speech therapy, who contribute their work experience to this training. Additionally, other recognized specialists participate in its design and preparation, which means that the program is developed in an interdisciplinary manner.





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*Learn the latest advances in procedures in Biomechanics and Voice Evaluation from leading professionals”*

## Management



### Ms. Martín Bielsa, Laura

- ◆ Speech therapist and teacher
- ◆ Expert in voice pathology
- ◆ Director of Multidisciplinary Center Dime Más
- ◆ CFP Estill Voice Training
- ◆ Extensively trained in different methods of vocal rehabilitation
- ◆ Dean of the Professional Association of Speech-Language Pathologists of Aragon



## Professors

### Ms. Corvo, Sandra

- ◆ Speech therapist
- ◆ Director of Clínica Córtes-Ciudad Rodrigo
- ◆ Master's Degree in Advances in Neurorehabilitation of Communicative and Motor Functions of the Gimbernat Cantabria School
- ◆ Currently working on her doctoral thesis on the improvement of voice and speech in patients with Parkinson's disease by means of motor co-programming through dance

### Mr. Fernández Peñarroya, Raúl

- ◆ Director of the Fisyos center in Andorra
- ◆ Physiotherapist with extensive training in Rehabilitation
- ◆ Manual therapy, fascial treatment and dry needling
- ◆ Research activity on aspects of physiotherapy treatment in Parkinson's disease

### Gómez, Agustín

- ◆ Speech therapist
- ◆ Director of the Alpadif center – Albacete
- ◆ Associate Professor and collaborator of the Speech Therapy Degree at the UCLM
- ◆ Diverse voice training: CFP Estill Voice Training and PROEL, among others
- ◆ Actor with more than 20 years of experience in different independent theatrical companies

### Pozo García, Susana

- ◆ Physiotherapist
- ◆ Director of the Fisyos Center in Andorra
- ◆ Specialist in Osteopathy Extensive training and clinical experience in myofascial induction, dry needling and lymphatic drainage
- ◆ Internship tutor at the Health Sciences University School of Zaragoza

### Quílez Félez, Olaya

- ◆ Health Psychologist at Dime Más Multidisciplinary Center and other Health Centers in Aragon
- ◆ Master's Degree in Neuropsychology
- ◆ Collaborator in research projects with the University of Zaragoza

### Romero Meca, Alizia

- ◆ Diploma in Musical Education
- ◆ CMT Certified Teacher at Estill Voice Training
- ◆ Currently preparing for certification as a CCI Instructor at Estill Voice Training
- ◆ Professional singer since 1996, with several tours and more than 500 performances
- ◆ Vocal Coach since 2000, teaching classes of all musical genres, levels and groups
- ◆ Director and singer of the Chamber Choir The Gospel Wave Choir
- ◆ Course Organizer for Official Estill Voice Training

04

# Structure and Content

The content structure has been designed by a team of professionals from the best education centers and universities in the country, who are aware of the relevance of current training and who are committed to quality teaching through new educational technologies.





## Module 1. Anatomical, Physiological and Biomechanical Basics of the Voice

- 1.1. Laryngeal Phylogeny and Embryology
  - 1.1.1. Laryngeal Phylogeny
  - 1.1.2. Laryngeal Embryology
- 1.2. Basic Concepts of Physiology
  - 1.2.1. Muscle Tissue
  - 1.2.2. Types of Muscle Fibers
- 1.3. Respiratory System Structures
  - 1.3.1. Chest:
  - 1.3.2. Airways
- 1.4. Respiratory System Musculature
  - 1.4.1. Inspiratory Muscles
  - 1.4.2. Expiratory Muscles
- 1.5. Respiratory System Physiology
  - 1.5.1. Respiratory System Function
  - 1.5.2. Lung Capacities and Volumes
  - 1.5.3. Lung Nervous System
  - 1.5.4. Breathing at Rest VS Breathing in Phonation
- 1.6. Laryngeal Anatomy and Physiology
  - 1.6.1. Laryngeal Skeleton
  - 1.6.2. Laryngeal Cartilages
  - 1.6.3. Ligaments and Membranes
  - 1.6.4. Joints
  - 1.6.5. Musculature
  - 1.6.6. Vascularization
  - 1.6.7. Laryngeal Innervation
  - 1.6.8. Lymphatic System
- 1.7. Structure and Function of the Vocal Cords
  - 1.7.1. Histology of the Vocal Cords
  - 1.7.2. Biomechanical Properties of the Vocal Cords
  - 1.7.3. Phases of the Vibration Cycle
  - 1.7.4. Fundamental Frequency
- 1.8. Anatomy and Physiology of the Vocal Tract
  - 1.8.1. Nasal Cavity
  - 1.8.2. Oral Cavity
  - 1.8.3. Laryngeal Cavity
  - 1.8.4. Linear and Non-Linear Source and Filter Theory
- 1.9. Voice Production Theory
  - 1.9.1. Historical Recap
  - 1.9.2. Edald's Primitive Myoelastic Theory
  - 1.9.3. Husson's Neuro-Chronaxial Theory
  - 1.9.4. Completed Mucocondulatory Theory and Aerodynamic Theory
  - 1.9.5. Neurooscillatory Theory
  - 1.9.6. Oscillo-Impedial Theory
  - 1.9.7. Mass-Spring Models
- 1.10. The Physiology of Phonation
  - 1.10.1. Neurological Control of Phonation
  - 1.10.2. Pressure
  - 1.10.3. Thresholds
  - 1.10.4. Beginnings and Endings of the Vibration Cycle
  - 1.10.5. Laryngeal Adjustments for Phonation

## Module 2. Objective Exploration of the Voice

- 2.1. Morphofunctional Exploration
  - 2.1.1. Indirect Laryngoscopy
  - 2.1.2. Nasofibrolaryngoscopy
  - 2.1.3. Teledaryngoscopy
  - 2.1.4. Stroboscopy
  - 2.1.5. Videochemography
- 2.2. Electroglottography
  - 2.2.1. Equipment
  - 2.2.2. Use.
  - 2.2.3. Electroglottographic Parameters
  - 2.2.4. Interpreting Results
- 2.3. Aerodynamic Measurements
  - 2.3.1. Equipment
  - 2.3.2. Use
  - 2.3.3. Aerodynamic Parameters
  - 2.3.4. Interpreting Results
- 2.4. Electromyography
  - 2.4.1. What an EMG Consists of
  - 2.4.2. Indicated Pathologies
  - 2.4.3. Procedure
  - 2.4.4. Interpreting Results
- 2.5. Video Chemography
  - 2.5.1. What an VKG Consists of
  - 2.5.2. Interpreting Results
- 2.6. Physical Aspects of the Voice
  - 2.6.1. Types of Waves
  - 2.6.2. Amplitude
  - 2.6.3. Frequency
  - 2.6.4. Time

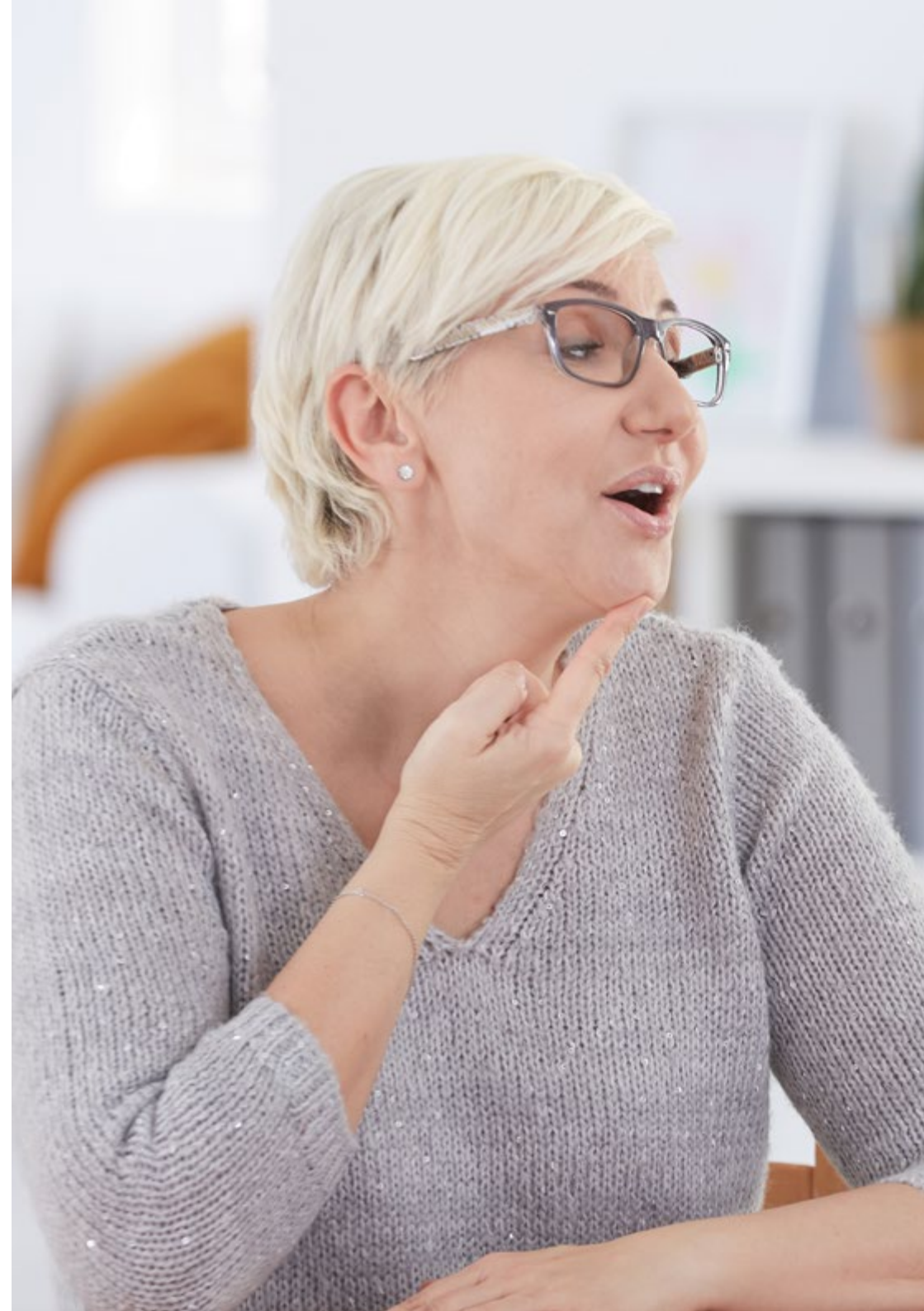
- 2.7. Acoustic Aspects of the Voice
  - 2.7.1. Intensity
  - 2.7.2. Pitch
  - 2.7.3. Duration
  - 2.7.4. Quality
- 2.8. Acoustic Analysis of Voice
  - 2.8.1. Fundamental Frequency
  - 2.8.2. Harmonics
  - 2.8.3. Formants
  - 2.8.4. Speech Acoustics
  - 2.8.5. The Spectrogram
  - 2.8.6. Disturbance Measures
  - 2.8.7. Noise Measures
  - 2.8.8. Voice Equipment/Laboratory
  - 2.8.9. Gathering Samples
  - 2.8.10. Interpreting Results

## Module 3. Functional Evaluation of the Voice

- 3.1. Perceptual Assessment
  - 3.1.1. GRBAS
  - 3.1.2. RASAT
  - 3.1.3. GBR Score
  - 3.1.4. CAPE- V
  - 3.1.5. VPAS
- 3.2. Assessment of Vocal Function
  - 3.2.1. Fundamental Frequency
  - 3.2.2. Phonetogram
  - 3.2.3. Maximum Phonatory Times
  - 3.2.4. Velo-Palatine Efficiency
  - 3.2.5. VHI



- 3.3. Medical History
  - 3.3.1. The Importance of the Clinical History
  - 3.3.2. Characteristics of the Initial Interview
  - 3.3.3. Medical History Sections and Voice Implications
  - 3.3.4. Proposal of a Model of Anamnesis for Vocal Pathology
- 3.4. Body Assessment
  - 3.4.1. Introduction
  - 3.4.2. Posture
    - 3.4.2.1. Ideal or Correct Posture
  - 3.4.3. Voice-Posture Relationship
  - 3.4.4. Posture Assessment
- 3.5. Respiratory Assessment
  - 3.5.1. Respiratory Function
  - 3.5.2. Breathing-Voice Relationship
  - 3.5.3. Aspects to Assess
- 3.6. Assessment of the Stomatognathic System
  - 3.6.1. Stomatognathic System
  - 3.6.2. Relationships Between the Stomatognathic System and Voice Production
  - 3.6.3. Evaluation
- 3.7. Assessing Vocal Function
  - 3.7.1. Vocal Quality
  - 3.7.2. High Quality Voice vs. Low Quality Voice
  - 3.7.3. Vocal Quality Assessment in Voice Professionals





- 3.8. Software for Assessing Vocal Function
  - 3.8.1. Introduction
  - 3.8.2. Free Software
  - 3.8.3. Buying Software
- 3.9. Materials to Collect Information and Assess Vocal Function
  - 3.9.1. Medical History
  - 3.9.2. Reading text for Speech Sample Collection in Spanish
  - 3.9.3. Perceptual Assessment (After Medical History and Anamnesis)
  - 3.9.4. Self-Assessment
  - 3.9.5. Assessing Vocal Function
  - 3.9.6. Respiratory Assessment
  - 3.9.7. Stomatognathic Assessment
  - 3.9.8. Posture Assessment
  - 3.9.9. Acoustic Analysis of Vocal Quality



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



05

# Methodology

This training program provides you with a different way of learning. Our methodology uses a cyclical learning approach: ***Re-learning***.

This teaching system is used 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 Re-learning, 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

In a given situation, what would you do? Throughout the program, you will be presented with multiple simulated clinical cases based on real patients, where you will have to investigate, establish hypotheses and, finally, 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 can 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 potential 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 professional medical 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 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 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.



## Re-learning Methodology

At TECH we enhance the Harvard case method with the best 100% online teaching methodology available: Re-learning.

Our 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, which represent a real revolution with respect to simply studying and analyzing cases.



*The physician 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.*



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

With this methodology we have trained more than 250,000 physicians with unprecedented success, in all clinical specialties regardless of the surgical load. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

*Re-learning 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 (we 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.



In this program you will have access to the best educational material, prepared with you 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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



#### Latest Techniques and Procedures on Video

We introduce you to the latest techniques, to the latest educational advances, to the forefront of current medical techniques. All this, in first person, with the maximum rigor, explained and detailed for your assimilation and understanding. And best of all, you can watch them as many times as you want.



#### Interactive Summaries

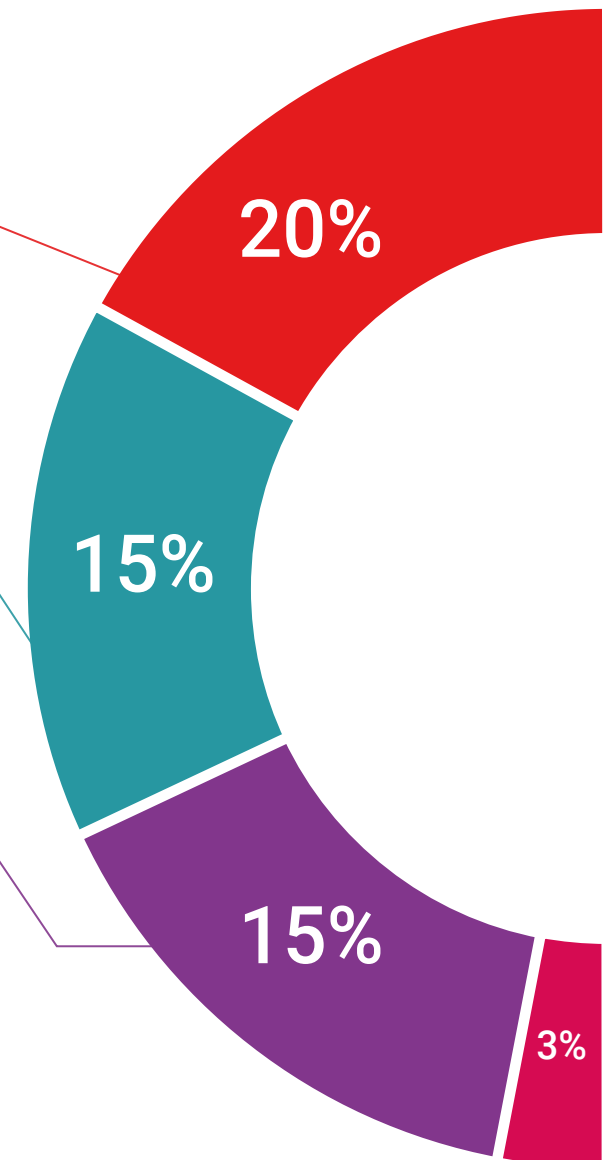
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

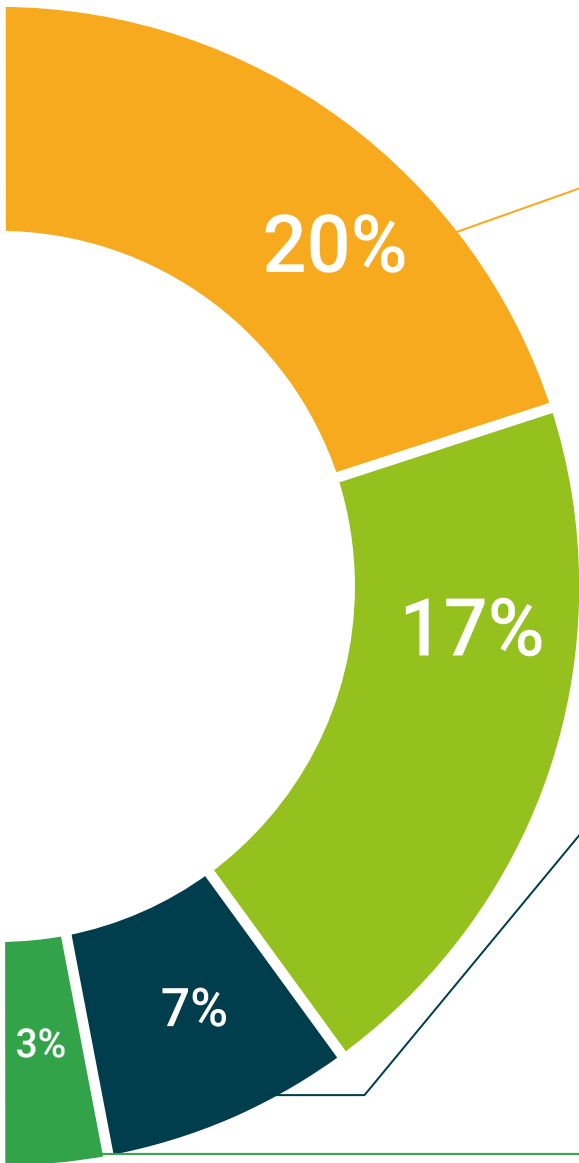
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



#### Additional Reading

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





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

Effective learning ought to be contextual. Therefore, we will present you with real case developments in which the expert will guide you through 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 your knowledge throughout the program, through assessment and self-assessment activities and exercises: so that you can see how you are achieving your goals.



**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 our difficult future decisions.



**Quick Action Guides**

We offer you the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help you progress in your learning.



# 06 Certificate

The Postgraduate Diploma in Biomechanics and Evaluation of the Voice in Medicine guarantees, in addition to the most accurate and up-to-date training, access to a qualification issued by TECH - Technological University.





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*Successfully complete this training and receive your university degree without the hassle of travel or laborious paperwork.*

This Postgraduate Diploma in Biomechanics and Voice Evaluation in Medicine is the most complete and up-to-date scientific program on the market.

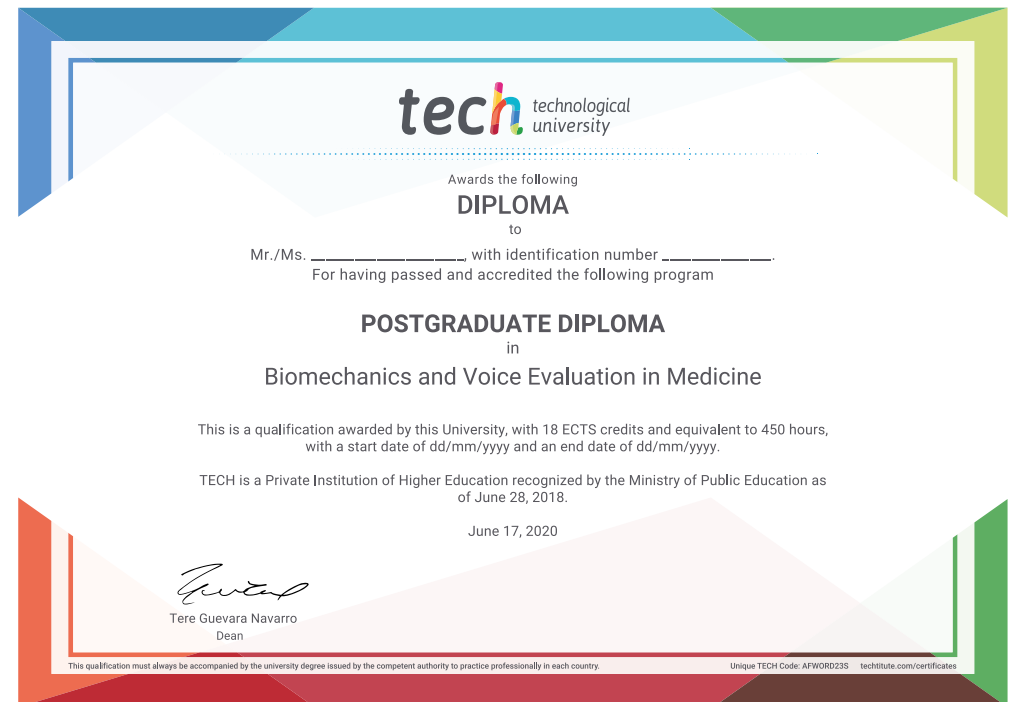
After the student has passed the assessments, they will receive their corresponding certificate issued by TECH - Technological University via tracked delivery\*.

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

Title: Postgraduate Diploma in Biomechanics and Voice Evaluation in Medicine

ECTS: 18

Official Number of Hours: 450



\*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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## Biomechanics and Voice Evaluation in Medicine

