

Postgraduate Diploma

Movement, Dynamic Systems and Velocity in Strength Training

Endorsed by the NBA





Postgraduate Diploma

Movement, Dynamic Systems and Velocity in Strength Training

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

Website: www.techtute.com/us/physiotherapy/postgraduate-diploma/postgraduate-diploma-movement-dynamic-systems-velocity-strength-training

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01

Introduction

The evolution of sports physiotherapy training is determined by a constant advance in science, methodologies and techniques. With this intensive program the student will specialize in Movements, Dynamic Systems and Speed in Strength Training applied to the field of physiotherapy.

A unique program designed by the best experts in the industry.





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The Postgraduate Diploma allows learning in simulated environments, which provide immersive learning programmed to train in real situations”

Strength training for athletes is a fundamental element in the prevention and treatment of chronic non-communicable diseases. Clinical training supervised by a physiotherapist decreases muscle weakness and injury risk, as it is an effective method to increase muscle mass and strength.

In this high-level specialization, special emphasis will be placed on identifying the main *skills*, classifying and ordering them, in order to propose efficient methodological proposals based on their understanding.

Throughout these months, the fundamental components of complex dynamic systems in sports training will be analyzed, delving not only into each of them, but also into each interaction and how they constantly modify our environment. The means and methods of strength training for the development of the different phases of speed will also be described.

Students of this Postgraduate Diploma will have a differentiating qualification with respect to their professional colleagues, being able to work in all areas of sport as a specialist in Strength Training in the field of physiotherapy.

Each subject has real specialists in the field to provide the best theoretical training and all their extensive practical experience which makes this Postgraduate Diploma unique.

Thus, TECH has set out to create contents of the highest teaching and educational quality that will turn students into successful professionals, following the highest quality standards in teaching at an international level. Therefore, we offer you this Postgraduate Diploma with extensive content that will help you reach the elite in physiotherapy. In addition, as it is an online Postgraduate Diploma, the student is not conditioned by fixed schedules or the need to move to another physical location, but can access the contents at any time of the day, balancing their work or personal life with their academic life.

This **Postgraduate Diploma in Movement, Dynamic Systems and Speed in Strength Training** contains the most complete and up-to-date scientific program on the market.

The most important features include:

- ♦ The development of numerous case studies presented by specialists in personal training
- ♦ The graphic, schematic and practical contents of the course are designed to provide all the essential information required for professional practice
- ♦ Exercises where the self-assessment process can be carried out to improve learning
- ♦ Algorithm-based interactive learning system for decisionmaking
- ♦ Special emphasis on innovative methodologies in physiotherapy
- ♦ 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 Postgraduate Diploma of high scientific rigor and improve your skills in strength training for high performance sports"

“

This Postgraduate Diploma is the best investment you can make when selecting a refresher program, for two reasons: in addition to updating your knowledge as a personal trainer, you will obtain a qualification from TECH Technological University"

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

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive training programmed to train 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 created by renowned experts in the subject.

Specialize and stand out in a sector with high demand for professionals.

Increase your knowledge in Movement, Dynamic Systems and Speed in Strength Training with this high-level specialization.



02 Objectives

The main objective of this program is the development of theoretical and practical learning, so that the physiotherapist can master in a practical and rigorous way the Prescription, Methodology and Bases for Strength Training.



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Our goal is to achieve academic excellence and help you achieve professional success. Don't hesitate any longer and join us”



General Objectives

- ♦ Deepen your knowledge based on the most current scientific evidence with full applicability in the practical field of strength training
- ♦ Master all the most advanced methods of strength training
- ♦ Apply with certainty the most current training methods to improve sports performance regarding strength
- ♦ Effectively master strength training for performance enhancement in time and mark sports as well as situational sports
- ♦ Master the principles governing exercise physiology and biochemistry
- ♦ Deepen in the principles governing the theory of complex dynamic systems as they relate to strength training
- ♦ Successfully integrate strength training for the improvement of Motor Skills immersed in sport
- ♦ Successfully master all the knowledge acquired in the different modules in real practice



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





Specific Objectives

Module 1. Strength Training to Improve Movement Skills

- ♦ Gain an in-depth understanding of the relationship between strength and skills
- ♦ Identify the main skills in sports in order, to analyze them, understand them and then enhance them through training
- ♦ Organize and systematize the skill development process
- ♦ Link and relate field and gym work to enhance the skills

Module 2. Strength Training Under the Paradigm of Complex Dynamic Systems

- ♦ Master specific knowledge about the theory of systems in sports training
- ♦ Analyze the different components that are interrelated in strength training and their application in situational sports
- ♦ Guide strength training methodologies towards a perspective that addresses the specific demands of sport
- ♦ Develop a critical view of the reality of strength training for athletic and non-athletic populations

Module 3. Strength Training to Improve Speed

- ♦ Know and interpret the key aspects of the techniques for speed and changing direction.
- ♦ Compare and differentiate the speed of situational sport with respect to the track and field model
- ♦ Gain in-depth knowledge of the mechanical aspects that may influence performance impairment and the mechanisms of injury occurrence when sprinting
- ♦ Analytically apply the different means and methods of strength training to develop sprinting

03

Course Management

Our teaching team has a wide prestige in the sector and are professionals with years of teaching experience who have joined forces to help you give a boost to your profession. For this reason, they have developed this Postgraduate Diploma with recent updates on the subject that will allow you to train and increase your skills in the field.





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

Management



Dr. Rubina, Dardo

- CEO of Test and Training
- EDM Physical Training Coordinator
- Physical trainer of the EDM First Team
- Master's Degree in (ARD) COE
- EXOS CERTIFICATION
- Specialist in Strength Training for the Prevention of Injuries, Functional and Physical-Sports Rehabilitation
- Specialist in Strength Training Applied to Physical and Sports Performance
- Specialist in Applied Biomechanics and Functional Evaluation
- Certification in Weight Management and Physical Performance Technologies
- Postgraduate course in Physical Activity in Populations with Pathologies
- Postgraduate diploma in Injury Prevention and Rehabilitation
- Functional Assessment and Corrective Exercise Certificate
- Certificate in Functional Neurology
- Diploma in Advanced Studies (DEA) University of Castilla la Mancha
- PhD Candidate in (ARD)

Professors

Mr. Añon, Pablo

- ◆ Degree in Physical Activity and Sport
- ◆ Postgraduate diploma in Sports Medicine and Sciences Applied to Sport
- ◆ Physical trainer of the National Volleyball team that will attend the next Olympic Games
- ◆ Certified strength and conditioning specialist, NSCA certification.
- ◆ NSCA National Conference

Mr. Gizzarelli, Matías Bruno

- ◆ Degree in Physical Education
- ◆ Training in Applied Neurosciences
- ◆ EXOS Performance Specialist
- ◆ Author of the Book "Basketball Training: Physical Preparation"

Mr. Rossanigo, Horacio

- ◆ BUILD Academy-Academic Services in Physical Training
- ◆ CEO, Jaguares- Rugby Union Argentina
- ◆ Degree in Physical Education and Physiology of Physical Work, FMS 1&2
- ◆ Lecturer in courses on sports performance



04

Structure and Content

The structure of the contents has been designed by a team of professionals knowledgeable about the implications of training in daily practice, aware of the relevance of quality education in the field of physiotherapy; and committed to quality teaching through new educational technologies.





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We have the most complete and up-to-date scientific program on the market. We want to provide you with the best education”

Module 1. Strength Training to Improve Movement Skills

- 1.1. Strength in Skill Development
 - 1.1.1. The Importance of Strength in Developing Skills
 - 1.1.2. Benefits of Skills-based Strength Training
 - 1.1.3. Types of Strength Present in Skills
 - 1.1.4. Training Means Necessary for the Development of Strength in Skills
- 1.2. Skills in Team Sports
 - 1.2.1. General Concepts
 - 1.2.2. Skills in Performance Development
 - 1.2.3. Classification of Skills
 - 1.2.3.1. Locomotive Skills
 - 1.2.3.2. Manipulative Skills
- 1.3. Agility and Movements
 - 1.3.1. Basic Concepts
 - 1.3.2. The Importance of Sports
 - 1.3.3. Agility Components
 - 1.3.3.1. Classification of Movement skills
 - 1.3.3.2. Physical Factors: Strength
 - 1.3.3.3. Anthropometric Factors
 - 1.3.3.4. Perceptual-Cognitive Components
- 1.4. Posture
 - 1.4.1. The Importance of Posture in Skills
 - 1.4.2. Posture and Mobility
 - 1.4.3. Posture and CORE
 - 1.4.4. Posture and Center of Pressure
 - 1.4.5. Biomechanical Analysis of Efficient Posture
 - 1.4.6. Methodological Resources
- 1.5. Linear Skills
 - 1.5.1. Characteristics of Linear Skills
 - 1.5.1.1. Main Planes and Vectors



- 1.5.2. Classification
 - 1.5.2.1. Starting, Braking and Deceleration
 - 1.5.2.1.1. Definitions and Context of Use
 - 1.5.2.1.2. Biomechanical Analysis
 - 1.5.2.1.3. Methodological Resources
 - 1.5.2.2. Acceleration
 - 1.5.2.2.1. Definitions and Context of Use
 - 1.5.2.2.2. Biomechanical Analysis
 - 1.5.2.2.3. Methodological Resources
 - 1.5.2.3. Backpedal
 - 1.5.2.3.1. Definitions and Context of Use
 - 1.5.2.3.2. Biomechanical Analysis
 - 1.5.2.3.3. Methodological Resources
- 1.6. Multidirectional Skills: *Shuffle*
 - 1.6.1. Classification of Multidirectional Skills
 - 1.6.2. *Shuffle*: Definitions and Context of Use
 - 1.6.3. Biomechanical Analysis
 - 1.6.4. Methodological Resources
- 1.7. Multi-Directional Skills: Crossover
 - 1.7.1. Crossover as a Change of Direction
 - 1.7.2. Crossover as a Transitional Movement
 - 1.7.3. Definitions and Context of Use
 - 1.7.4. Biomechanical Analysis
 - 1.7.5. Methodological Resources
- 1.8. *Jump Skills I*
 - 1.8.1. The Importance of Jumps in *Skills*
 - 1.8.2. Basic Concepts

- 1.8.2.1. Biomechanics of Jumps
- 1.8.2.2. CEA
- 1.8.2.3. *Stiffness*
- 1.8.3. Jump Classification
- 1.8.4. Methodological Resources
- 1.9. *Jump Skills II*
 - 1.9.1. Methods
 - 1.9.2. Acceleration and Jumps
 - 1.9.3. *Shuffle* and Jumps
 - 1.9.4. Crossover and Jumps
 - 1.9.5. Methodological Resources
- 1.10. Programming Variables

Module 2. Strength Training Under the Paradigm of Complex Dynamic Systems

- 2.1. Introduction to Complex Dynamical Systems
 - 2.1.1. Models Applied to Physical Preparation
 - 2.1.2. The Determination of Positive and Negative Interactions
 - 2.1.3. Uncertainty in Complex Dynamical Systems
- 2.2. Motor Control and its Role in Performance
 - 2.2.1. Introduction to Motor Control Theories
 - 2.2.2. Movement and Function
 - 2.2.3. Motor Learning
 - 2.2.4. Motor Control Applied to Systems Theory
- 2.3. Communication Processes in the Theory of Systems
 - 2.3.1. From Message to Movement
 - 2.3.1.2. The Efficient Communication Process
 - 2.3.1.3. The Stages of Learning
 - 2.3.1.4. The Role of Communication and Sport Development in Early Ages
 - 2.3.2. VAKT Principles
 - 2.3.3. Knowledge of Performance vs. Knowledge of the Result
 - 2.3.4. Verbal *feedback* in System Interactions
- 2.4. Strength as an Essential Condition

- 2.4.1. Strength Training in Team Sports
- 2.4.2. Manifestations of Strength Within the System
- 2.4.3. The Strength-Speed Continuum. Systemic Review
- 2.5. Complex Dynamical Systems and Training Methods
 - 2.5.1. Periodization. Historical Review
 - 2.5.1.1. Traditional Periodization
 - 2.5.1.2. Contemporary Periodization
 - 2.5.2. Analysis of Periodization Models in Training Systems
 - 2.5.3. Evolution of Strength Training Methods
- 2.6. Strength and Motor Divergence
 - 2.6.1. Developing Strength at Early Ages
 - 2.6.2. The Manifestations of Strength in Infantile-Juvenile Ages
 - 2.6.3. Efficient Programming at Youth Ages
- 2.7. The Role of Decision-Making in Complex Dynamical Systems
 - 2.7.1. The Decision-Making Process
 - 2.7.2. Decisional *Timing*
 - 2.7.3. The Development of Decision Making
 - 2.7.4. Programming Training Based on Decision Making
- 2.8. Perceptual Abilities in Sports
 - 2.8.1. Visual Abilities
 - 2.8.1.1. Visual Recognition
 - 2.8.1.2. Central and Peripheral Vision
 - 2.8.2. Motor Experience
 - 2.8.3. Attentional Focus
 - 2.8.4. The Tactical Component
- 2.9. Systemic Vision of Programming
 - 2.9.1. The Influence of Identity on Programming
 - 2.9.2. The System as a Path to Long-Term Development.
 - 2.9.3. Long-Term Development Program
- 2.10. Global Programming: from System to Need
 - 2.10.1. Program Design
 - 2.10.2. Practical System Assessment Workshop

Module 3. Strength Training to Improve Speed

- 3.1. Strength
 - 3.1.1. Definition
 - 3.1.2. General Concepts
 - 3.1.2.1. Manifestations of Strength
 - 3.1.2.2. Factors that Determine Performance
 - 3.1.2.3. Strength Requirements for *Sprint* Improvement Connection Between Force Manifestations and *Sprinting*
 - 3.1.2.4. Speed- Strength Curve
 - 3.1.2.5. Relationship of the S-S and Power Curve and its Application to *Sprint* Phases
 - 3.1.2.6. Development of Muscular Strength and Power
- 3.2. Dynamics and Mechanics of Linear *Sprint* (100m Model)
 - 3.2.1. Kinematic Analysis of the Take-off
 - 3.2.2. Dynamics and Strength Application During Take-off
 - 3.2.3. Kinematic Analysis of the Acceleration Phase
 - 3.2.4. Dynamics and Strength Application During Acceleration
 - 3.2.5. Kinematic Analysis of Running at Maximum Speed
 - 3.2.6. Dynamics and Strength Application During Maximum Speed
- 3.3. Analysis of Acceleration Technique and Maximum Speed in Team Sports
 - 3.3.1. Description of the Technique in Team Sports
 - 3.3.2. Comparison of Sprinting Technique in Team Sports vs. Athletic Events
 - 3.3.3. Timing and Motion Analysis of Speed Events in Team Sports
- 3.4. Exercises as Basic and Special Means of Strength Development for *Sprint* Improvement
 - 3.4.1. Basic Movement Patterns
 - 3.4.1.1. Description of Patterns with Emphasis on Lower Limb Exercises
 - 3.4.1.2. Mechanical Demand of the Exercises
 - 3.4.1.3. Exercises Derived from Olympic Weightlifting
 - 3.4.1.4. Ballistic Exercises

- 3.4.1.5. S-S Curve of the Exercises
 - 3.4.1.6. Strength Production Vector
- 3.5. Special Methods of Strength Training Applied to *Sprinting*
 - 3.5.1. Maximum Effort Method
 - 3.5.2. Dynamic Effort Method
 - 3.5.3. Repeated Effort Method
 - 3.5.4. French *Complex* and Contrast Method
 - 3.5.5. Speed-Based Training
 - 3.5.6. Strength Training as a Means of Injury Risk Reduction
- 3.6. Means and Methods of Strength Training for Speed Development
 - 3.6.1. Means and Methods of Strength Training for the Development of the Acceleration Phase
 - 3.6.1.1. Connection of Force to Acceleration
 - 3.6.1.2. Sledding and Racing Against Resistance
 - 3.6.1.3. Slopes
 - 3.6.1.4. Jumpability
 - 3.6.1.4.1. Building the Vertical Jump
 - 3.6.1.4.2. Building the Horizontal Jump
 - 3.6.2. Means and Methods for Top Speed Training
 - 3.6.2.1. Plyometry
 - 3.6.2.1.1. Concept of the *Shock* Method
 - 3.6.2.1.2. Historical Perspective
 - 3.6.2.1.3. *Shock* Method Methodology for Speed Improvement
 - 3.6.2.1.4. Scientific Evidence
- 3.7. Means and Methods of Strength Training Applied to Agility and Change of Direction
 - 3.7.1. Determinants of Agility and COD
 - 3.7.2. Multidirectional Jumps
 - 3.7.3. Eccentric Strength

- 3.8 Assessment and Control of Strength Training
 - 3.8.1. Strength-Speed Profile
 - 3.8.2. Speed Load Profile
 - 3.8.3. Progressive Loads
- 3.9. Integration.
 - 3.9.1. Case Study



A unique, key, and decisive program 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"

At TECH we use the Case Method

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

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



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

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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. Physiotherapists/kinesiologists who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on practical skills that allow the physiotherapist/kinesiologist to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.



Relearning Methodology

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

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



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

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

With this methodology we trained more than 65,000 physiotherapists/kinesiologists with unprecedented success in all clinical specialties, regardless of the workload. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

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

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

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



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



Study Material

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

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



Physiotherapy Techniques and Procedures on Video

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



Interactive Summaries

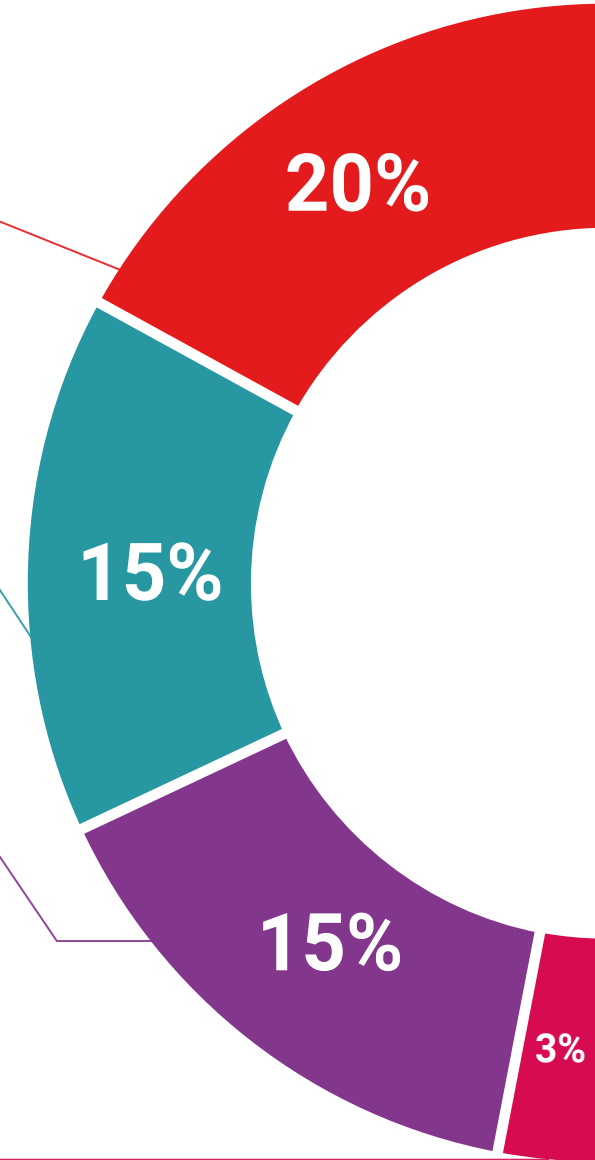
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

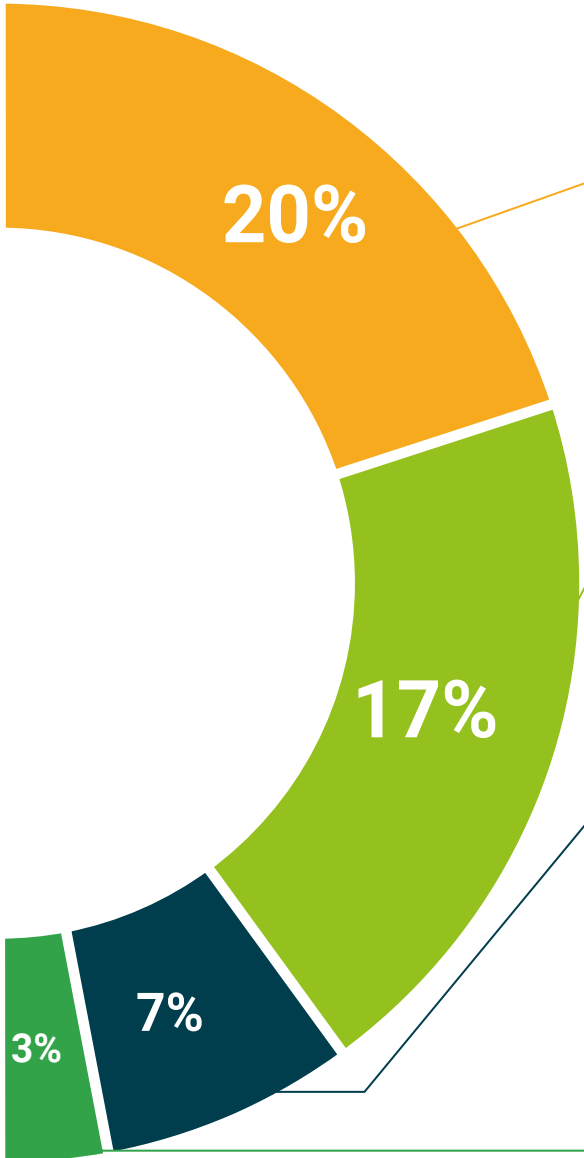
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



Additional Reading

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





Expert-Led Case Studies and Case Analysis

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



Testing & Retesting

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



Classes

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



Quick Action Guides

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



06 Certificate

This Postgraduate Diploma in Movement, Dynamic Systems and Speed in Strength Training guarantees students, in addition to the most rigorous and up-to-date education, 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 Movement, Dynamic Systems and Speed in Strength Training** 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 reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Movement, Dynamic Systems and Speed in Strength Training**

Official N° 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.

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



Postgraduate Diploma

Movement, Dynamic
Systems and Velocity
in Strength Training

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

Postgraduate Diploma

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tech technological
university