



Performance Evaluation and Strength Sports
Training

» Modalidad: online

» Duración: 6 meses

» Titulación: TECH Universidad Tecnológica

» Acreditación: 18 ECTS» Dedicación: 16h/semana

» Horario: a tu ritmo

» Exámenes: online

We bsite: https://www.techtitute.com/us/sports-science/postgraduate-diploma/postgraduate-diploma-performance-evaluation-stength-sports-training

# Index

p. 32

Certificate





# tech 06 | Introduction

In recent years, strength training has burst with great impetus in the scientific community, covering multiple contexts ranging from sports performance in time and brand sports to situational sports, including the whole range of sports modalities.

This Postgraduate Certificate addresses the vital importance of strength in human performance in all its possible expressions with a unique level of theoretical depth and a level of descent to the practical totally different from what has been seen so far.

The student of this Postgraduate Diploma will have a differentiating training with respect to their professional colleagues, being able to perform in all areas of sport as a specialist in Strength Training.

The teaching team of this Postgraduate Diploma in Performance Evaluation and Strength Sports Training has made a careful selection of each of the topics of this training to offer the student a study opportunity as complete as possible and always linked to current events.

Thus, at TECH we have set out to create contents of the highest teaching and educational quality that will turn our students into successful professionals, following the highest quality standards in teaching at an international level. Therefore, we show you this Postgraduate Diploma with a rich content that will help you reach the elite of physical training. 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 Performance Evaluation and Strength Training** contains the most complete and up-to-date scientific program on the market. The most important features of the program include:

- The development of numerous case studies presented by specialists in personal training.
- The graphic, schematic, and eminently practical contents with which they are created contain information that is indispensable for professional practice.
- It contains exercises where the self-assessment process can be carried out to improve learning.
- Algorithm-based interactive learning system for decision-making.
- Special emphasis on innovative methodologies in personal training.
- 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 in the selection of a refresher program for two reasons: in addition to updating your knowledge as a personal trainer, you will obtain a degree from TECH"

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.

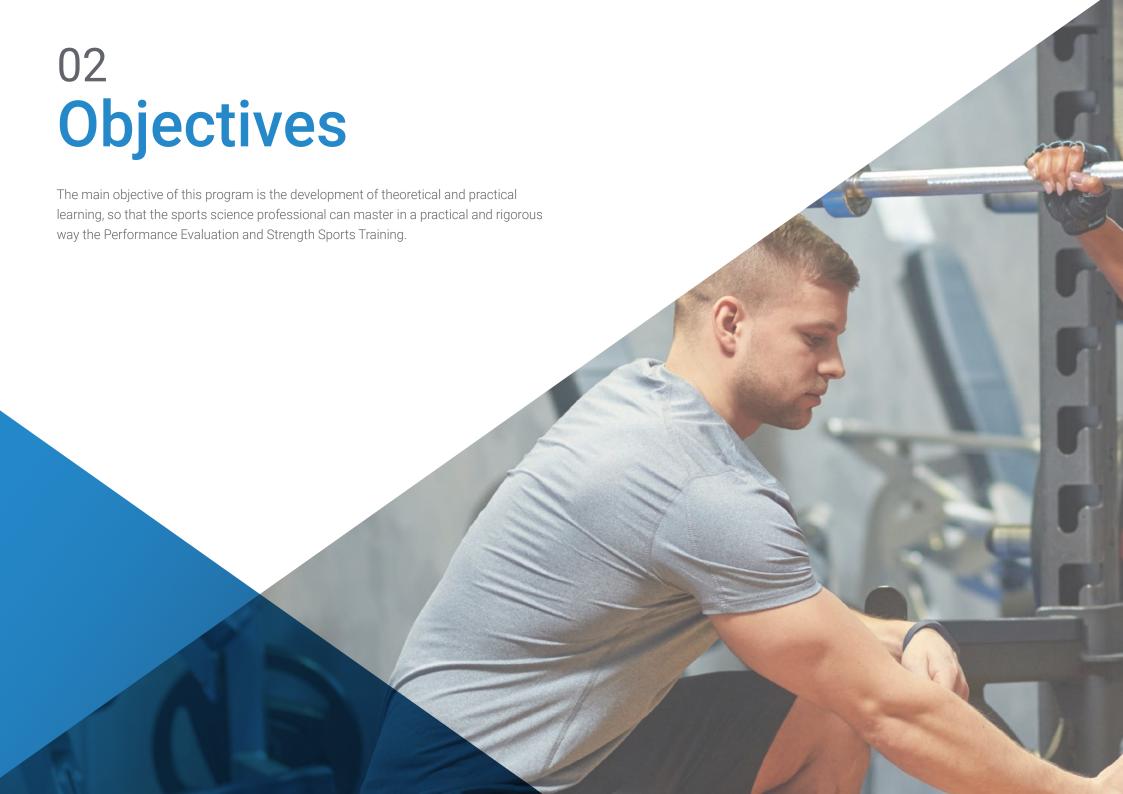
Its multimedia content, developed with the latest educational technology, will allow the professional a situated and contextual learning, that is, a simulated environment that will provide an immersive training programmed to train in real situations.

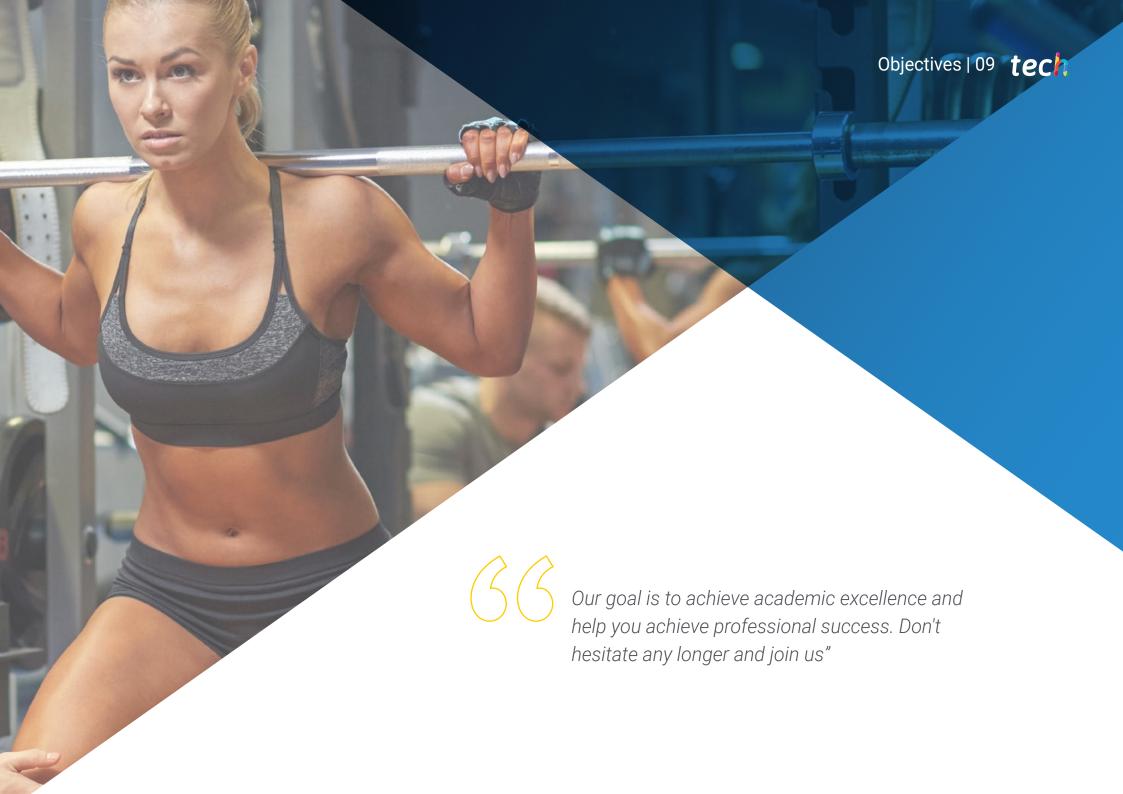
This program is designed around Problem Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the academic year. To do so, the professional will be assisted by an innovative interactive video system developed by renowned and experienced experts in Performance Evaluation and Strength Sports Training.

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

Increase your knowledge in Performance Evaluation and Strength Training with this high-level training.







# tech 10 | Objectives



# **General Objectives**

- Delve into the 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, as well as Biochemistry
- Delve into the principles that govern 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"



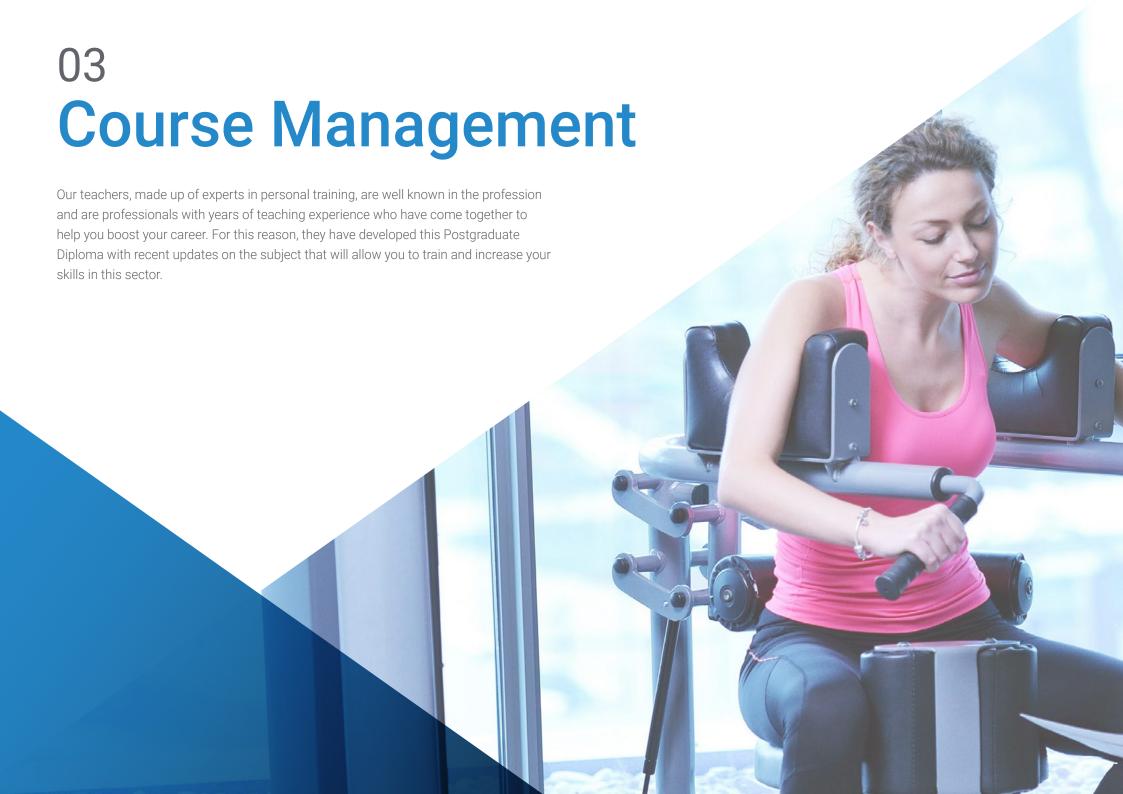


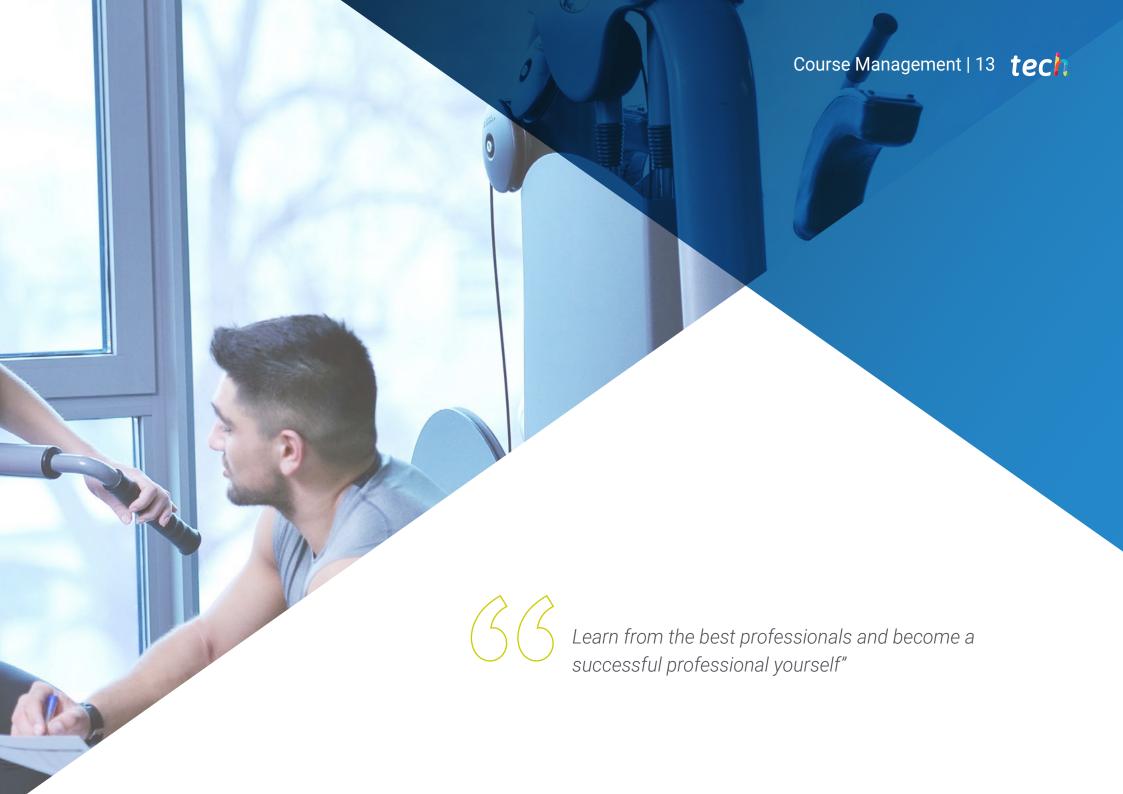
# Objectives | 11 tech



# **Specific Objectives**

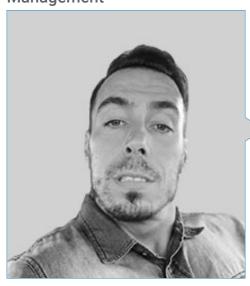
- Specialize in the different types of assessment and their applicability to the field of practice.
- Select the most appropriate tests for your specific needs
- Correctly and safely administer the protocols of the different tests and the interpretation of the data collected
- Delve into and apply different types of technologies currently used in the field of assessment, in the field of health and fitness performance at any level of demand.
- Gain an in-depth understanding of the logic of movement-based training design
- Differentiate between means and methods for strength
- Detect priority movement patterns for applying force in the sport at hand
- Understand the functioning and application of technological means in the service of strength training
- Identify and analyze the mechanisms of force production in different endurance disciplines.
- Gain in-depth knowledge of the different means and methods of strength training and their practical application.
- Delve into the effects of concurrent training and its responses on endurance.
- Program and organize strength training





# tech 14 | Course Management

# Management



# 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**

### Graduate. 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.

### Graduate. Carbone, Leandro

- Degree in Physical Education
- Specialist in exercise physiology
- Msc Strength and Conditioning
- CSCS-NASCA, CISSN-ISSN
- Currently at Club The Strongest
- Collaborator with olympic athletes.

## Graduate. Masse, Juan

- Degree in Physical Education
- Director of the Athlos study group
- Physical trainer for several professional soccer teams in South America, experienced teacher.

### Graduate. Palarino, Matías

- Degree in Physical Activity and Sport
- Physical trainer in Professional Soccer
- Physical Trainer in Field Hockey
- Physical Trainer in Rugby
- Extensive teaching experience in physical preparation and load control courses.

## Graduate. Tinti, Hugo

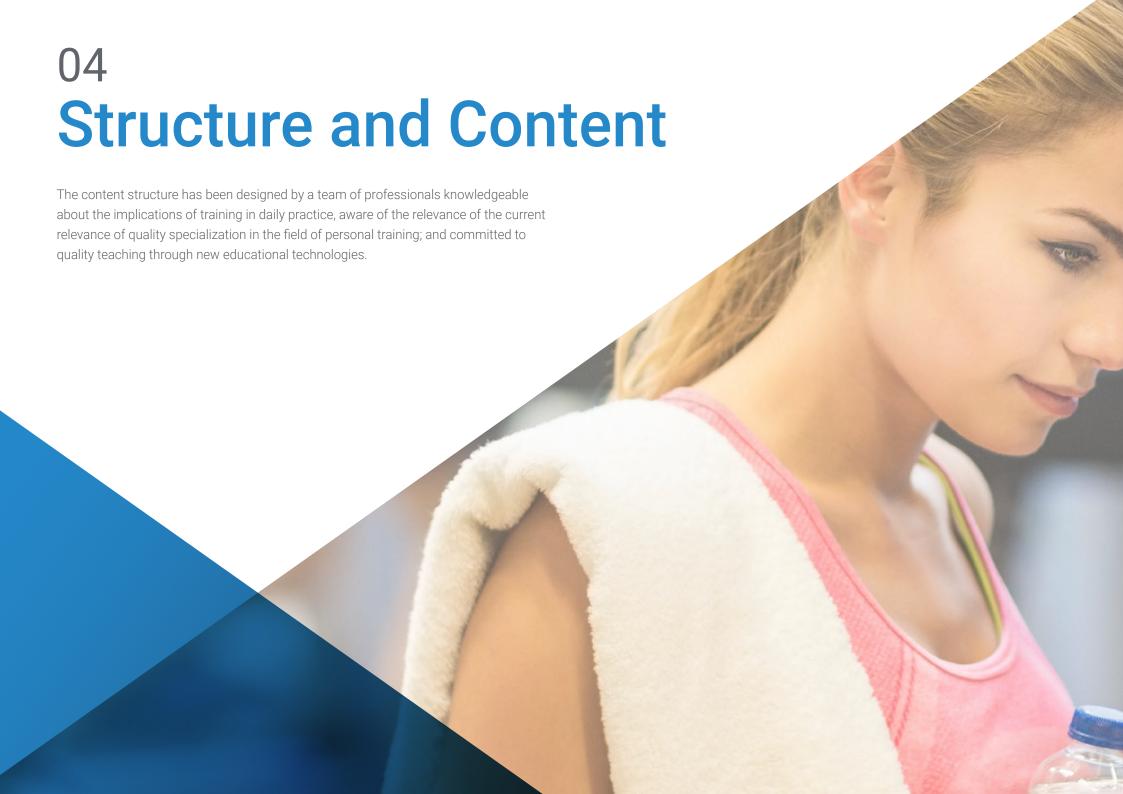
- Degree in Physical Activity and Sport
- Master's Degree in Big Data
- Specialist in Technologies and Injury Prevention in Soccer
- Specialist in load management.

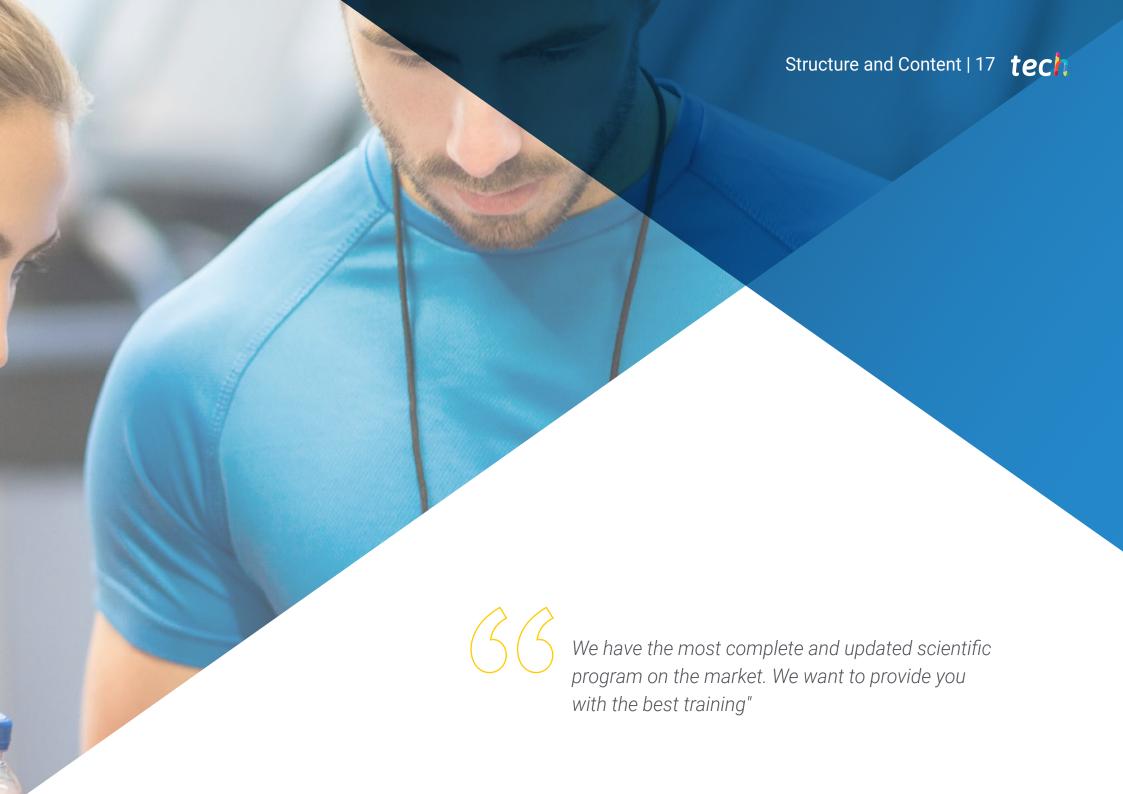
### Graduate. Vaccarini, Adrián

- · Degree in sports medicine
- Head of the Applied Sciences Department of the Peruvian soccer federation
- Physical trainer of the Peruvian National Soccer Team (present in the last World Cup).

### Graduate. Vilariño, Leandro

- Degree in Physical Activity and Sport
- Teacher at the Peruvian Federation of Soccer
- Teacher of the Postgraduate Diploma in Sports Medicine
- Physical trainer in professional soccer in the Argentine and Bolivian leagues.





# tech 18 | Structure and Content

# Module 1. Assessing Sports Performance in Strength Training

- 1.1. Assessment
  - 1.1.1. General Concepts on Assessment, Test and Measuring.
  - 1.1.2. Test Characteristics
  - 1.1.3. Types of Tests
  - 1.1.4. Assessment Objectives
- 1.2. Neuromuscular Technology and Assessments.
  - 1.2.1. Contact Mat
  - 1.2.2. Strength Platforms
  - 1.2.3. Load Cell
  - 1.2.4. Accelerometers
  - 1.2.5. Position Transducers
  - 1.2.6. Cellular Applications for Neuromuscular Evaluation
- 1.3. Submaximal Repetition Test
  - 1.3.1. Protocol for its Assessment.
  - 1.3.2. Validated Estimation Formulas for the Different Training Exercises
  - 1.3.3. Mechanical and Internal Load Responses During a Submaximal Repetition Test.
- 1.4. Progressive Incremental Maximal Test (TPImax)
  - 1.4.1. Naclerio and Figueroa Protocol 2004.
  - 1.4.2. Mechanical (Linear Encoder) and Internal Load (PSE) Responses During a Max TPI.
  - 1.4.3. Determining the Optimal Zone for Power Training.
- 1.5. Horizontal Jump Test
  - 1.5.1. Assessmen Without Using Technology.
  - 1.5.2. Assessment Using Technology (Horizontal Encoder and Force Platform).
- 1.6. Simple Vertical Jump Test
  - 1.6.1. Squat Jump (SJ) Assessment
  - 1.6.2. Countermovement Jump (CMJ) Assessment
  - 1.6.3. Assessment of an Abalakov Salto ABK
  - 1.6.4. Drop Jump (DJ) Assessment
- 1.7. Rebound Jump Test
  - 1.7.1. 5-second Repeated Jump Test





# Structure and Content | 19 tech

- 1.7.2. 15-second Repeated Jump Test
- 1.7.3. 30-second Repeated Jump Test
- 1.7.4. Fast Strength Endurance Index (Bosco)
- 1.7.5. Effort Exercise Rate in the Rebound Jump Test
- 1.8. Mechanical responses (Strength, Power and Speed/Time) During Single and Repeated Jumps Tests
  - 1.8.1. Strength/Time in Simple and Repeated Jumps
  - 1.8.2. Speed/Time in Single and Repeated Jumps
  - 1.8.3. Power/Time in Simple and Repeated Jumps
- 1.9. Strength/Speed Profiles in Horizontal Vectors
  - 1.9.1. Theoretical Basis of an S/S Profile
  - 1.9.2. Morin and Samozino Assessment Protocols
  - 1.9.3. Practical Applications
  - 1.9.4. Contact Carpet, Linear Encoder and Force Platform Evaluation of Forces.
- 1.10. Strength/Speed Profiles in Vertical Vectors
  - 1.10.1. Theoretical Basis of an S/S Profile
  - 1.10.2. Morin and Samozino Assessment Protocols
  - 1.10.3. Practical Applications
  - 1.10.4. Contact Carpet, Linear Encoder and Force Platform Evaluation of Forces.
- 1.11. Isometric Tests
  - 1.11.1. McCall Test
    - 1.11.1.1. Evaluation Protocol and Values Recorded With a Force Platform.
  - 1.11.2. Mid-Thigh Pull Test
    - 1.11.2.1. Evaluation Protocol and Values Recorded With a Force Platform.

# Module 2. Strength Training in Situational Sports

- 2.1. Basic Fundamentals
  - 2.1.1. Functional and Structural Adaptations
    - 2.1.1.1. Functional Adaptations
    - 2.1.1.2. Load-Pause Ratio (Density) as a Criterion for Adaptation

# tech 20 | Structure and Content

- 2.1.1.3. Strength as a Base Quality
- 2.1.1.4. Mechanisms or Indicators for Structural Adjustments
- 2.1.1.5. Utilization, Conceptualization of the Muscular Adaptations Provoked, as an Adaptive Mechanism of the Imposed Load. (Mechanical Stress, Metabolic Stress, Muscle Damage)
- 2.1.2. Motor Unit Recruitment
  - 2.1.2.1. Recruitment Order, Central Nervous System Regulatory Mechanisms, Peripheral Adaptations, Central Adaptations Using Tension, Speed or Fatigue as a Tool for Neural Adaptation.
  - 2.1.2.2. Order of Recruitment and Fatigue During Maximum Effort
  - 2.1.2.3. Recruitment Order and Fatigue During Submaximal Efforts
  - 2.1.2.4. Fibrillar Recovery
- 2.2. Specific Fundamentals
  - 2.2.1. Movement as a Starting Point
  - 2.2.2. Quality of Movement as a General Objective for Motor Control, Motor Patterning and Motor Programming
  - 2.2.3. Priority Horizontal Movements
    - 2.2.3.1. Accelerating, Braking, Change of Direction with inside leg and outside leg, Maximum Absolute Speed and/or SubMaximum Speed. Technique, Correction and Application According to the Specific Movements in Competition
  - 2.2.4. Priority Vertical Movements
    - 2.2.4.1. Jumps, Hops, Bounds. Technique, Correction and Application According to the Specific Movements in Competition.
- 2.3. Technological Means for the Assessment of Strength Training and External Load Control
  - 2.3.1. Introduction to Technology and Sport
  - 2.3.2. Technology for Strength and Power Training Assessment and Control

- 2.3.2.1. Rotary Encoder (Operation, Interpretation Variables, Intervention Protocols, Application)
- 2.3.2.2. Load Cell (Operation, Interpretation Variables, Intervention Protocols, Application)
- 2.3.2.3. Strength Platforms (Operation, Interpretation Variables, Intervention Protocols, Application)
- 2.3.2.4. Electric Photocells (Operation, Interpretation Variables, Intervention Protocols, Application)
- 2.3.2.5. Contact Mat (Operation, Interpretation Variables, Intervention Protocols, Application)
- 2.3.2.6. Accelerometer (Operation, Interpretation Variables, Intervention Protocols, Application)
- 2.3.2.7. Applications for Mobile Devices (Operation, Interpretation Variables, Intervention Protocols, Application).
- 2.3.3. Intervention Protocols for the Assessment and Control of Training.
- 2.4. Controlling the Internal Load
  - 2.4.1. Subjective Load Perception by Rating the Perceived Exertion.
    - 2.4.1.1. Subjective Perception of Load to Estimate Relative Load (% 1MR)
  - 2.4.2. Scope
    - 2.4.2.1. As Exercise Control
      - 2.4.2.1.1. Repetitions and PRE
      - 2.4.2.1.2. Repetitions in Reserve
      - 2.4.2.1.3. Scale of Speed
    - 2.4.2.2. Controlling the Overall Effect of a Session
    - 2.4.2.3. As a Tool for Periodization

- 2.4.2.3.1. Use of (APRE) Self-Regulated Progressive Resistance Exercise, Interpretation of the Data and its Relation to the Correct Dosage of the Load in the Session
- 2.4.3. Recovery Quality Scale, Interpretation and Practical Application in the Session (TQR 0-10)
- 2.4.4. As a Tool for Daily Practice
- 2.4.5. Application
- 2.4.6. Recommendations
- 2.5. Means for Strength Training
  - 2.5.1. Role of the Mean in Designing a Method
  - 2.5.2. Means at the Service of a Method and in Function of a Central Sporting Objective
  - 2.5.3. Types of Means
  - 2.5.4. Movement Patterns and Activations as a Central Axis for Media Selection and Method Implementation.
- 2.6. Building a Method
  - 2.6.1. Defining the Types of Exercises
    - 2.6.1.1. Cross-Connectors as a Guide to the Movement Target
  - 2.6.2. Exercise Evolution
    - 2.6.2.1. Modification of the Rotational Component and the Number of Supports According to the Plane of Motion
  - 2.6.3. Exercise Organization
    - 2.6.3.1. Relationship With Priority Horizontal and Vertical Movements (2.3 and 2.4)
- 2.7. Practical Implementation of a Method (Programming)
  - 2.7.1. Logical Implementation of the Plan
  - 2.7.2. Implementation of a Group Session

- 2.7.3. Individual Programming in a Group Context
- 2.7.4. Strength in Context Applied to the Game
- 2.7.5. Periodization Proposal
- 2.8. ITU 1 (Integrating Thematic Unit)
  - 2.8.1. Training Construction for Functional and Structural Adaptations and Recruitment Order
  - 2.8.2. Constructing a Training Monitoring and/or Assessment System
  - 2.8.3. Movement-Based Training Construction for the Implementation of Fundamentals, Means and External and Internal Load Control
- 2.9. ITU 2 (Integrating Thematic Unit)
  - 2.9.1. Construction of a Group Training Session
  - 2.9.2. Construction of a Group Training Session in Context Applied to the Game
  - 2.9.3. Construction of a Periodization of Analytical and Specific Loads

## **Module 3.** Training in Medium and Long Duration Sports

- 3.1. Strength
  - 3.1.1. Definition and concept
  - 3.1.2. Continuum of Conditional Capabilities
  - 3.1.3. Strength Requirements for Endurance Sports. Scientific Evidence
  - 3.1.4. Strength manifestations and their relationship to neuromuscular adaptations in endurance sports.
- 3.2. Scientific Evidence on the Adaptations of Strength Training and its Influence on Medium and Long Duration Endurance Tests

# tech 22 | Structure and Content

	3.2.1.	Neuromuscular Adaptations		3.5.5.	Plyometric Training and Jumping Development as an Important Part of Improving
	3.2.2.	Metabolic and Endocrine Adaptations		Running Economy	
	3.2.3.	Adaptations When Performing Specific Tests	3.6.	Exercis	es and Special Means of Strength Training for Medium and Long Endurance Sports
3.3.	Principle of Dynamic Correspondence Applied to Endurance Sports			3.6.1.	Movement Patterns
	3.3.1.	Biomechanical Analysis of Force Production in Different Gestures: Running, Cycling,		3.6.2.	Basic Exercises
		Swimming, Rowing, Cross-Country Skiing		3.6.3.	Ballistic Exercises
	3.3.2.	Parameters of Muscle Groups Involved and Muscle Activation		3.6.4.	Dynamic Exercises
	3.3.3.	Angular Kinematics		3.6.5.	Resisted and Assisted Strength Exercises
	3.3.4.	Rate and Duration of Force Production		3.6.6.	CORE Exercises
	3.3.5.	Stress Dynamics	3.7.	Strength Training Programming Based on the Microcycle Structure	
	3.3.6.	Amplitude and Direction of Movement		3.7.1.	Selection and Order of Exercises
3.4.	Concurrent Strength and Endurance Training			3.7.2.	Weekly Frequency of Strength Training
	3.4.1.	Historical Perspective.		3.7.3.	Volume and Intensity According to the Objective
	3.4.2.	Interference Phenomenon		3.7.4.	Recovery Times
		3.4.2.1. Molecular Aspects	3.8.	Strengt	th Training Aimed at Different Cyclic Disciplines
		3.4.2.2. Sports Performance		3.8.1.	Strength Training for Middle-Distance and Long-Distance Runners
	3.4.3.	Effects of Strength Training on Endurance		3.8.2.	Strength Training for Cycling
	3.4.4.	Effects of Resistance Training on Strength Demonstrations		3.8.3.	Strength Training for Swimming
	3.4.5.	Types and Modes of Load Organization and Their Adaptive Responses		3.8.4.	Strength Training for Rowing
	3.4.6.	Concurrent Training. Evidence on Different Sports		3.8.5.	Strength Training for Cross-Country Skiing
3.5.	Strength Training		3.9.	Contro	lling the Training Process
	3.5.1.	Means and Methods for Maximum Strength Development.		3.9.1.	Load Speed Profile
	3.5.2.	Means and Methods for Explosive Strength Development.		3.9.2.	Progressive Load Test
	3.5.3.	Means and Methods for Reactive Strength Development.			
	3.5.4.	Compensatory and Injury Risk Reduction Training.			

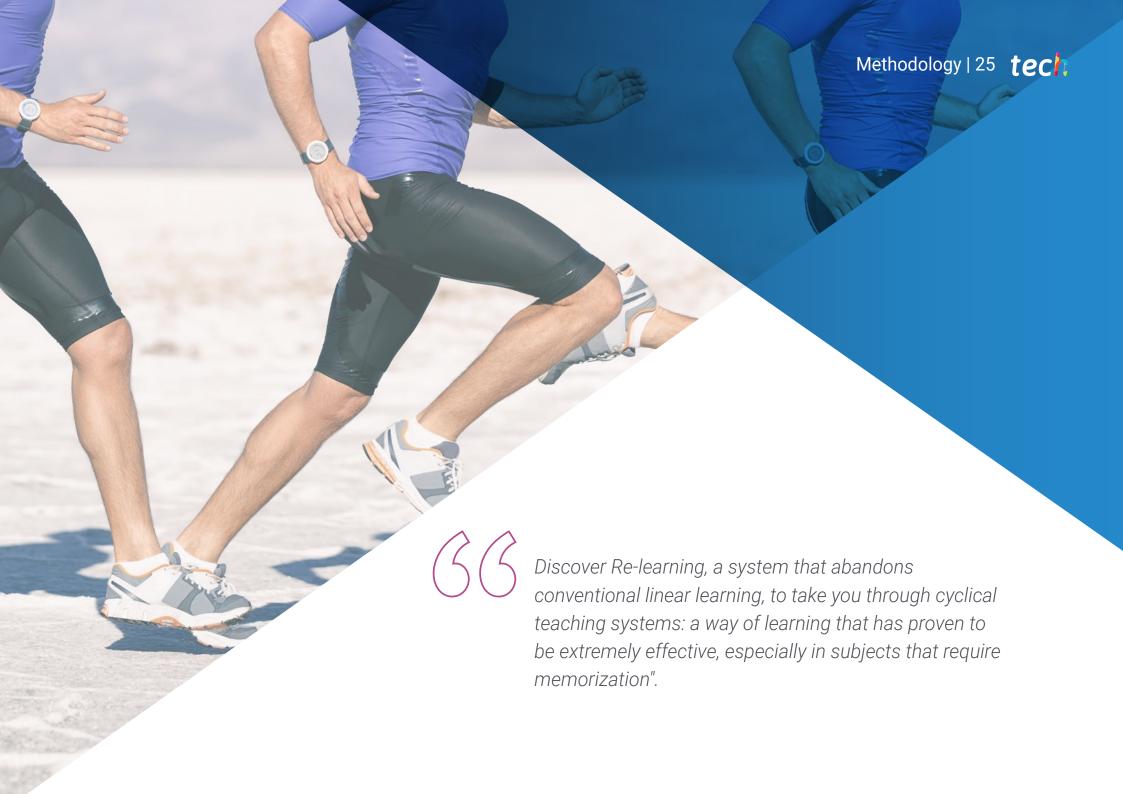






A unique, key, and decisive training experience to boost your professional development"





# tech 26 | Methodology

### At TECH we use the Case Method

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



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



Our University is the first in the world to combine Harvard Business School case studies with a 100%-online learning system based on repetition.



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

# A learning method that is different and innovative.

This Sports Science program at TECH Technological University is an intensive program that prepares you to face all the challenges in this field, both nationally and internationally. We are committed to promoting your personal and professional growth, the best way to strive for success, that is why at TECH you will use Harvard case studies, with which we have a strategic agreement that allows us to offer you material from the best university in the world.



We are the only online university that offers Harvard materials as teaching materials on its courses"

The case method is the most widely used learning system by 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.

In a given situation, what would you do? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the course, you will be presented with multiple real cases. You will have to combine all your knowledge, and research, argue, and defend your ideas and decisions.

# **Re-Learning Methodology**

Our University is the first in the world to combine Harvard University case studies with a 100%-online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance Harvard case studies with the best 100% online teaching method: Re-learning.

In 2019 we obtained the best learning results of all Spanish-language 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 Re-learning.

Our University is the only one in Spanish-speaking countries licensed to incorporate 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 Spanish online university indicators.



# Methodology | 29 tech

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. 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.

Re-learning 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 to success.

Based on the latest evidence in neuroscience, not only do we know how to organize information, ideas, images, memories, but we also know that the place and context where we have learned something is crucial for us to be able to remember it and store it in the hippocampus, and 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.

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 highly 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.



### **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 future difficult decisions.



### **Practising Skills and Abilities**

You will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization we live in.



# **Additional Reading**

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



20%

### **Case Studies**

You will complete a selection of the best case studies in the field used at Harvard. Cases that are presented, analyzed, and supervised by the best senior management specialists in Latin America.



**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".



# **Testing & Re-testing**

We periodically evaluate and re-evaluate your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.



4%





# tech 34 | Certificate

This Postgraduate Diploma in Performance Evaluation and 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.** 

This certificate contributes to the academic development of the professional and adds a high university curricular value to their training. It is 100% valid in all competitive examinations, labour exchanges and professional career evaluation committees.

Title: Postgraduate Diploma in Performance Evaluation and Strength Sports Training

**ECTS: 18** 

Nº Hours: 450

Endorsed by the NBA





<sup>\*</sup>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.

# ealth formalion in



# Postgraduate Diploma

Performance Evaluation and Strength Sports Training

- » Modalidad: online
- » Duración: 6 meses
- » Titulación: TECH Universidad Tecnológica
- » Acreditación: 18 ECTS
- » Dedicación: 16h/semana
- » Horario: a tu ritmo
- » Exámenes: online

