

# Professional Master's Degree Fitness Instructor

Endorsed by the NBA





## Professional Master's Degree Fitness Instructor

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/sports-science/professional-master-degree/master-fitness-instructor](http://www.techtute.com/us/sports-science/professional-master-degree/master-fitness-instructor)

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# 01

# Introduction

In today's society, we are immersed in a real quest for perfection in which the state of the body plays a fundamental role. But, beyond the simply aesthetic, physical condition has a determining role in the state of health. This has led more and more people to find a way to improve their physical condition in gyms, and more and more of these institutions require qualified personnel to work as instructors. Under this premise, this academic program has been designed to train professionals in Sports Sciences to work in this exciting field with the guarantee of having the highest level of knowledge and skills. In this way, TECH demonstrates its commitment to remain at the forefront and to meet the needs of the labor market with the highest quality and excellence.





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*With this Professional Master's Degree, you will not only improve as a professional, but you will also contribute to a healthier world by promoting positive practices as a Fitness Instructor”*

The world of fitness has undergone a growing evolution in recent decades. In the image society, more and more people seek to achieve physical standards for which physical exercise is essential. This is why gyms are increasingly crowded with users determined to improve their bodies and, to this end, these institutions demand qualified professionals who can respond, in a concrete and knowledge-based manner, to the needs of customers.

In addition, the profession of Fitness Instructor has become a career with great benefits and opportunities, as there is a wide range of job. However, in order to carry out this job effectively and based on excellence, the acquisition and renewal of professional knowledge is a fundamental issue.

With this premise in mind, this complete Professional Master's Degree from TECH is born, which aims to provide the sports science professional with the most up-to-date and innovative knowledge in terms of management and sports monitoring in gyms. To this end, key aspects will be addressed through contents of the highest level, managed under a highly efficient and unique methodology in the current academic program.

In order to cover all the necessary topics to graduate the best fitness instructors in the industry, TECH professionals have established the information in didactic modules taught by highly qualified teachers. This guarantees the student a high level of knowledge adapted to the demands of today's professional and work environment. A program that, being taught online, gives the student the possibility to study without neglecting the rest of their daily activities.

Thus, during the course of the academic program, important aspects such as the administration of this type of sports institutions, the physiology of exercise or the management and monitoring of group classes will be dealt with. In this way, the student is offered a transversal and complete vision of the Fitness Instructor's work that will allow them to work successfully in the profession.

Another strong point of this Professional Master's Degree in Fitness Instructor is the specialization of the student in certain pathologies such as, for example, metabolic syndrome, obesity or special conditions such as pregnancy, which are very frequent cases in the daily life of a Fitness Instructor, and whose knowledge is ignored by the majority, since they are not taught in base careers. In this Professional Master's Degree, each of these cases is studied in depth under a strict scientific rigor and with a methodology oriented towards the implementation of what has been learned in order to assist this type of users.

This **Professional Master's Degree in Fitness Instructor** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ◆ Practical cases presented by experts in Physical Activity and Sport
- ◆ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional development
- ◆ Practical exercises where self-assessment can be used to improve learning
- ◆ Its special emphasis on innovative methodologies
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*Become a positive turning point in peoples' health, motivating their physical change as a Fitness Instructor"*

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*You are looking at a great academic opportunity that will lay the foundation for your professional growth and allow you to compete with the best in the industry”*

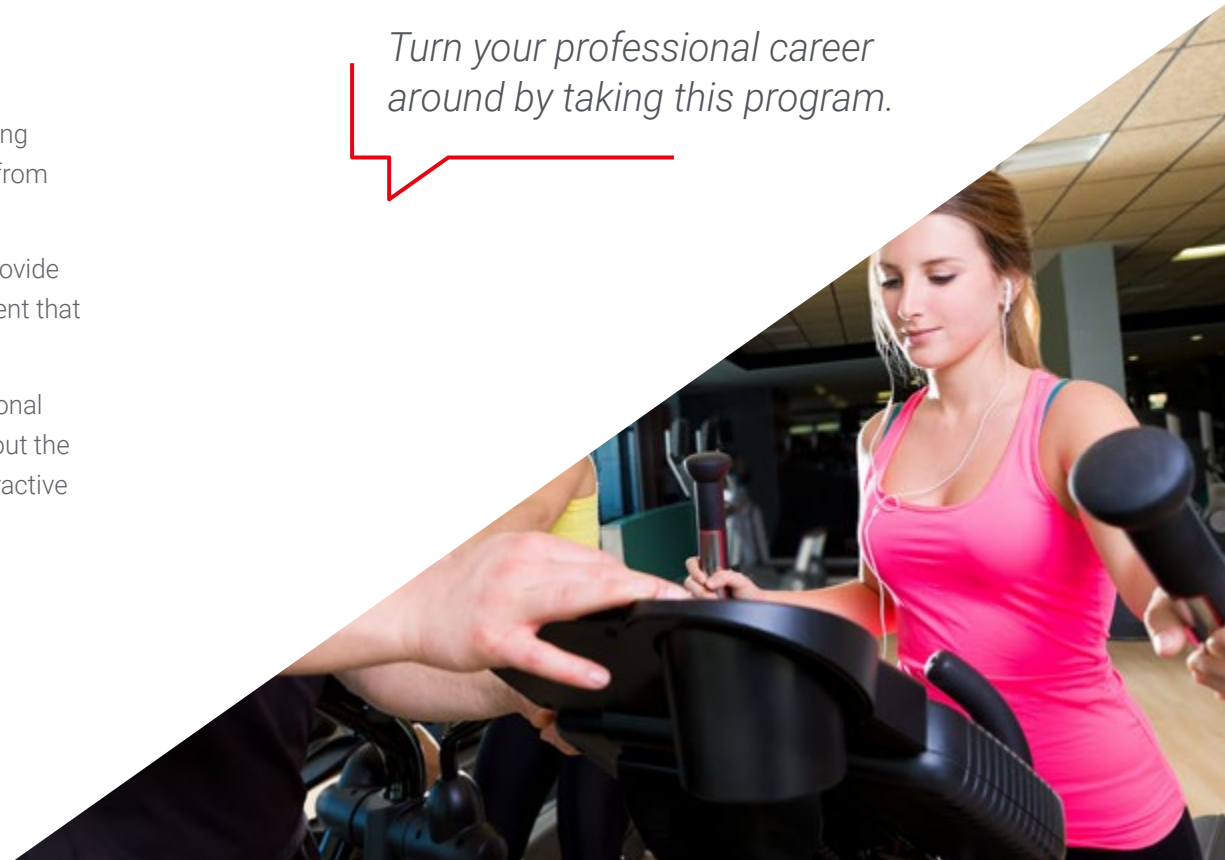
The program includes, in its teaching staff, professionals from the sector who bring their work experience to this refresher program, as well as renowned specialists from reference societies and prestigious universities.

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 knowledge 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 created by renowned and experienced experts.

*The tools, knowledge and skills you will acquire will enable you to excel in a sector that increasingly requires more and more specialized instructors”*

*Turn your professional career around by taking this program.*



# 02 Objectives

The Professional Master's Degree in Fitness Instructor at TECH was created with the fundamental objective of promoting the acquisition of specific skills in the student that will become the basis that will support their daily practice. To this end, a program of the highest level has been established based on the latest developments in the sector and created with the utmost scientific rigor. These contents, will be taught by a team of top professionals, who will provide the student with valuable tools to work as a Fitness Instructor with greater guarantees of success. In this way, the professional will be able to revalue their profile and position themselves at the forefront of a booming sector.







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*Make a career in the world of sports and begin to achieve your professional goals by taking this complete academic program”*



## General Objectives

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- ◆ Acquire knowledge based on the most current scientific evidence with full applicability in the practical field
- ◆ Master all the most advanced methods of sports performance evaluation
- ◆ Master and apply with certainty the most current training methods to improve sports performance and quality of life, as well as to improve the most common pathologies
- ◆ Master the principles governing exercise physiology, as well as biochemistry
- ◆ Successfully integrate all the knowledge acquired in the different modules in real practice





## Specific Objectives

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### Module 1. Exercise Physiology and Physical Activity

- ◆ Know and interpret key aspects of biochemistry and thermodynamics
- ◆ In-depth understanding of energy metabolic pathways and their exercise-mediated modifications and their role in human performance
- ◆ In-depth knowledge of key aspects of the neuromuscular system, motor control and its role in physical training
- ◆ In-depth knowledge of muscle physiology, the process of muscle contraction and the molecular basis of this process
- ◆ Know the functioning of the cardiovascular and respiratory systems and the use of oxygen during exercise
- ◆ In-depth knowledge of the general causes of fatigue and impact in different types and modalities of exercise
- ◆ know the different physiological milestones and their application in practice

### **Module 2. Logistics and Administrative Role of the Indoor Instructor**

- ◆ Provide the student with information on the main administrative tasks required to organize the different activities proposed and the responsible and professional human resources that work there
- ◆ Provide the Fitness Instructor with the theoretical knowledge as well as the necessary tools to coordinate the logistics of this field of work
- ◆ Have an in-depth knowledge of the different types of tasks related to administrative logistics
- ◆ Understand the importance of the administrative functions of a fitness center as part of their professional work
- ◆ Correct management of administrative tasks and human resources of the gym
- ◆ Select with criteria and apply different types of management strategies according to their real work context

### **Module 3. Mobility Training**

- ◆ Approach mobility as a basic physical capacity from a neurophysiological perspective
- ◆ Have a deep understanding of the neurophysiological principles that affect the development of mobility
- ◆ Know and apply the stabilizing and mobilizing systems within the movement pattern
- ◆ Develop and specify the basic concepts and objectives related to mobility training
- ◆ Develop the ability to design tasks and plans to improve mobility
- ◆ Know and apply the different methods of performance optimization through recovery methods
- ◆ Develop the ability to perform a functional and neuromuscular assessment of the athlete/client
- ◆ Recognize and address the effects of a neuromuscular injury on the athlete/client

### **Module 4. Group Classes**

- ◆ Have an in-depth knowledge of different types of group classes and their applicability to the field of practice
- ◆ Select those group classes most appropriate to the needs and desires of heterogeneous populations
- ◆ Manage correctly and with solid arguments those pedagogical-methodological strategies that characterize the profile of the different group classes proposed
- ◆ Know and apply different types of strategies that provide a safe environment for handling the external load that characterizes the modality of each type of group class proposed

### **Module 5. Obesity and Physical Exercise**

- ◆ Understand in depth the pathophysiology of obesity and its repercussions on health
- ◆ Understand the physical limitations of the obese individual
- ◆ Be able to plan and program training in an individualized way for a person with obesity

### **Module 6. Physical Exercise in Children, Adolescents and Older Adults**

- ◆ In-depth understanding of the biopsychosocial aspects of children, adolescents and older adults
- ◆ In-depth knowledge of the particularities of each age group and their specific approach
- ◆ Be able to plan and program training in an individualized way for children, adolescents and older adults

**Module 7. Physical Exercise and Pregnancy**

- ◆ Know in depth the morphofunctional changes of the pregnancy process
- ◆ In-depth understanding of the biopsychosocial aspects of pregnancy
- ◆ Be able to plan and program training in an individualized way for a pregnant woman

**Module 8. Sports Performance Assessment**

- ◆ In-depth knowledge of 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
- ◆ Know and apply different types of technologies currently used in the field of exercise assessment, both in the field of health and fitness performance at any level of demand

**Module 9. Strength Training**

- ◆ Know and correctly interpret all theoretical aspects that define force and its components
- ◆ Know and master the most effective strength training methods
- ◆ Develop sufficient criteria to be able to support the choice of different training methods in their practical application
- ◆ Be able to objectify the strength needs of each client/athlete whatever their needs may be
- ◆ Master the theoretical and practical aspects that define power development
- ◆ Correctly apply strength training in the prevention and rehabilitation of injuries

**Module 10. Indoor Targeted Personal Training**

- ◆ In-depth understanding of the pathophysiology of metabolic syndrome
- ◆ Understand the intervention criteria to improve the health and quality of life of patients with this pathology
- ◆ Be able to plan and program training in an individualized way for a person with metabolic syndrome



*Your goals and TECH's goals come together and materialize in this academic program with excellent curricular"*

# 03 Skills

The structure of this Professional Master's Degree has been designed to ensure that the Sports Science professional is able to work as a Fitness Instructor, knowing in depth all the singularities of the sector and knowing how to respond to the problems and inconveniences that may arise. All this, based on a unique methodology and the support of the best experts in the field. Thus, TECH guarantees students a high-quality content according to their expectations, giving them the opportunity to excel in their area of work. Additionally, the student will be able to perform the various functions related to this Professional Master's Degree, along with the most innovative proposals in this field of action, thus guiding them towards excellence.





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*In a world dominated by the importance of image, working as a Fitness Instructor with specific skills becomes a key aspect to change people's perception and motivate their health above all else"*



## General Skills

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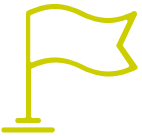
- ◆ Acquire knowledge based on the most current scientific evidence with full applicability in the field of gym instructors
- ◆ Master all the most advanced methods of gym management
- ◆ Know the national and international market, through the practical experience of the professionals who are part of the faculty
- ◆ Have a global vision of how gyms operate
- ◆ Know the national international ecosystem in this sector
- ◆ Employ leadership skills within a fitness center and learn how to properly manage people in this sector

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*The skills you will acquire after completing this Professional Master's degree will allow you to practice your profession with greater guarantees of success”*







## Specific Skills

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- ◆ Possess complete knowledge to be able to successfully enter the world of training, physical activity and health
- ◆ Know how to perform their duties both in the population that attends the gym for aesthetic or quality of life purposes, as well as in populations with common pathologies
- ◆ Be able to approach training with different objectives with real knowledge
- ◆ Develop the student's understanding of how physiological systems involved in physical activity respond to a single exercise session, and how various training modes and environmental conditions can modify these systems and their response to stress
- ◆ Be able to coordinate the administrative system of a gym in order for it to function optimally
- ◆ Know the differences between popular concepts and beliefs about mobility and its training, as well as the objectives and different application methods and their repercussion in time at a neuromuscular level and, consequently, in sports performance
- ◆ Know in depth the methodological and pedagogical profile behind the different group class proposals that can be found in most training centers and gyms
- ◆ Understand and know how to apply the planning and programming of training adjusted to the needs and dysfunctionality of individuals with obesity in order to generate perceptible changes in the health of the person
- ◆ Understand and know how to apply the planning and programming of training adjusted to the needs of pregnant women according to the stage of pregnancy
- ◆ Know and know how to apply the different tests and physical tests that exist in order to know the state of physical fitness of the individual
- ◆ Understand, from the latest scientific evidence, the benefits of strength training
- ◆ Know the latest scientific and technological advances for the control of loads during strength training
- ◆ Understand, in an extensive and detailed way, the characteristics that define people with obesity, altered glucose values, dyslipidemia and/or hypertension

# 04

# Course Management

One of the aspects that make this Professional Master's Degree unique compared to others in the sector is the teaching staff. Thus, the professional who decides to take this program with TECH will learn with a faculty of excellence, with years of experience in the sector and with the greatest desire to graduate the best in this field. For this reason, this team has also designed the contents of the Postgraduate Diploma, ensuring the student a complete learning experience, based on the highest scientific rigor and the latest developments in the sector.



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*Learn from the best in the industry and start to see your career take flight towards excellence”*

## Management



### Mr. Rubina, Dardo

- CEO of Test and Training
- EDM Physical Training Coordinator
- Physical trainer of the EDM First Team
- Master's Degree in High Performance in Sports (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
- Certification in Weight Management and Physical Performance Technologies
- Postgraduate course in Physical Activity in Populations with Pathologies
- Diploma in Advanced Studies (DEA) University of Castilla la Mancha
- PhD in High Performance Sports (ARD)

## Professors

### Mr. Carbone, Leandro

- ◆ Degree in Physical Education
- ◆ Specialist in exercise physiology
- ◆ Msc Strength and Conditioning
- ◆ NSCA Certified Strength Training and Conditioning Specialist (CSCS) Certification
- ◆ Certified Sports Nutritionist from the International Society of Sports Nutrition
- ◆ Collaborator with Olympic athletes

### Mr. Masse, Juan Manuel

- ◆ Director of the Athlon Science Study Group
- ◆ Physical trainer for several professional soccer teams in South America

### Mr. Jareño Díaz, Juan

- ◆ Coordinator of the education and physical preparation area at the Moratalaz Sports School
- ◆ Degree in Physical Activity and Sports Sciences from the University of Castilla la Mancha
- ◆ Master's Degree in Physical Preparation in Soccer
- ◆ Master's Degree in Secondary Education Teaching
- ◆ Postgraduate course in Personal Training

### Ms. Riccio, Anabella

- ◆ Functional training teacher at DISTRITO B
- ◆ Degree in Physical Education
- ◆ Specialist in Exercise Programming and Assessment
- ◆ Course in biochemistry for exercise programming

### Mr. Varela, Mauricio

- ◆ Physical Education Teacher. Faculty of Humanities and Educational Sciences. National University of La Plata
- ◆ Teacher of physical activity classes in a personalized way for older adults
- ◆ Physical Trainer, Personal Trainer of Elite Cyclists at the Astronomy Cycling Circuit
- ◆ Physical Education Teacher EES 62, EES 32, EET 5, EES56, EES 31
- ◆ Specialization in Exercise Programming and Assessment (Postgraduate course, FaHCE-UNLP) Cohort
- ◆ ISAK Anthropometrist level 1

### Mr. Renda, Juan

- ◆ National Professor of Physical Education. ISEF No. 1 "Dr. Enrique Romero Brest".
- ◆ Degree in Kinesiology and Physiatry. University Institute H.A. Foundation Bachelo
- ◆ Bachelor's Degree in Physical Education with a specialization in Physiology of General Physical Work at San Martin National University.
- ◆ Master's Degree in Physical Education at the National University of Lomas de Zamora

### Mr. Delovo, Nahuel

- ◆ Physical Education Teacher
- ◆ Physical Trainer Peruvian Rugby Federation
- ◆ General Coordinator at Athlon Capacitaciones
- ◆ Strength and Conditioning World Rugby, Level1
- ◆ Strength and Conditioning World Rugby, Pre Level2

05

# Structure and Content

The structure and contents of this Professional Master's Degree in Fitness Instructor have been conceived, designed and created by a group of professionals of reference in the physical activity sector. This team, aware of the relevance and timeliness of education in this field, has made a major effort to generate the most complete and up-to-date syllabus on the market. A compendium of contents that is complemented by the work of other experts, who provide the syllabus with a highly didactic multimedia format that provides the student with an immersive, complete and contextual learning experience.





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*The content of this Professional Master's Degree will lay the foundations for your professional growth and will turn you into a true expert in the field"*

## Module 1. Exercise Physiology and Physical Activity

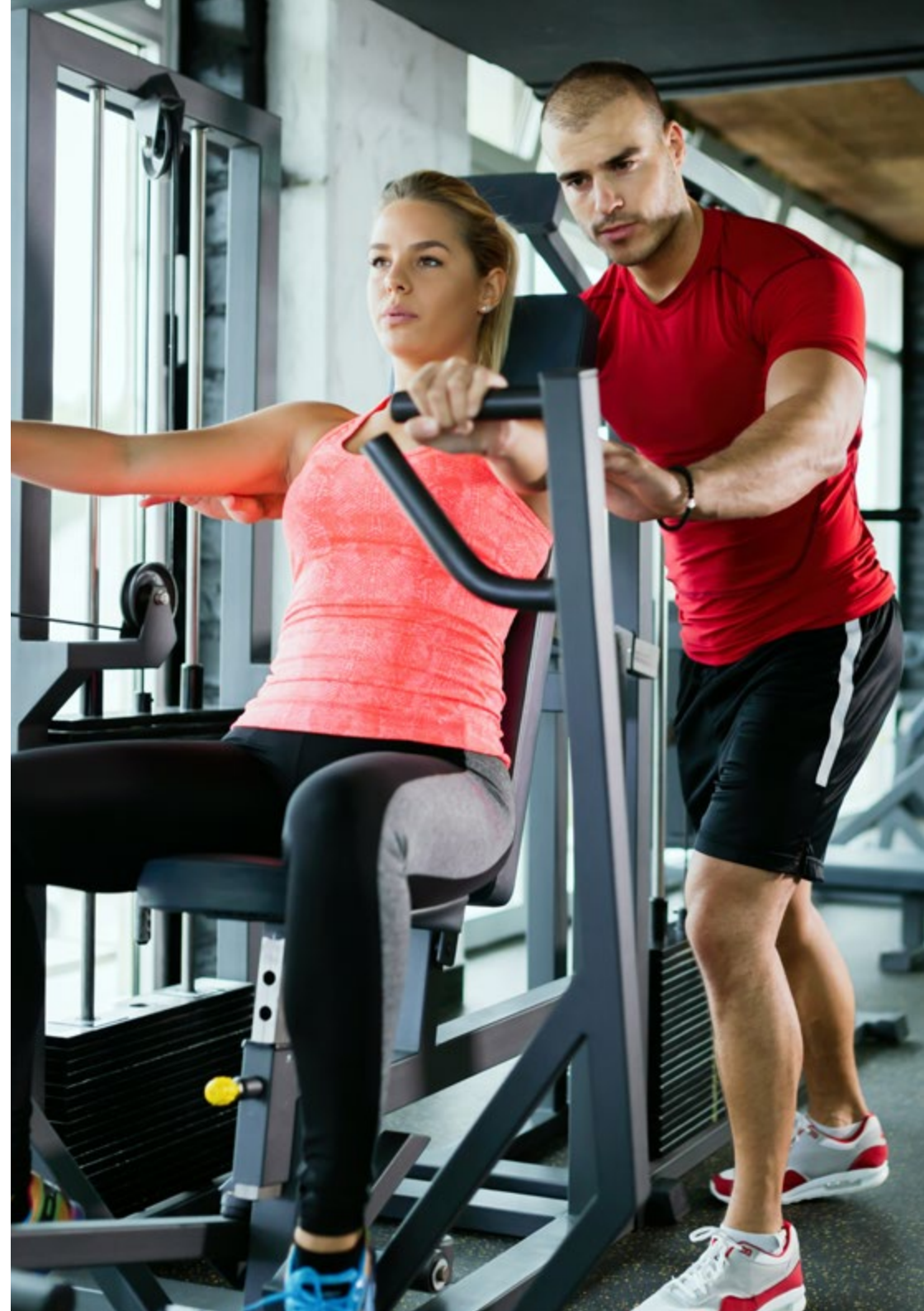
- 1.1. Thermodynamics and Bioenergetics
  - 1.1.1 Organic Chemistry
  - 1.1.2 Functional Groups
  - 1.1.3 Enzymes
  - 1.1.4 Coenzymes
  - 1.1.5 Acids and Bases
  - 1.1.6 PH
- 1.2. Energy Systems
  - 1.2.1 Energy Systems
    - 1.2.1.1. Capacity and Power
    - 1.2.1.2. Cytoplasmic Vs. Mitochondrial
  - 1.2.2 Phosphagen Metabolism
    - 1.2.2.1. ATP - PC
    - 1.2.2.2. Pentose Pathway
    - 1.2.2.3. Nucleotide Metabolism
  - 1.2.3 Metabolism of Carbohydrates
    - 1.2.3.1. Glycolysis
    - 1.2.3.2. Glycogenogenesis
    - 1.2.3.3. Glycogenolysis
    - 1.2.3.4. Gluconeogenesis
  - 1.2.4 Lipid Metabolism
    - 1.2.4.1. Bioactive Lipids
    - 1.2.4.2. Lipolysis
    - 1.2.4.3. Beta-oxidation
    - 1.2.4.4. De Novo Lipogenesis Synthesis
  - 1.2.5 Oxidative Phosphorylation
    - 1.2.5.1. Oxidative Decarboxylation of Pyruvate
    - 1.2.5.2. Krebs Cycle
    - 1.2.5.3. Electron Transport Chain
    - 1.2.5.4. ROS
    - 1.2.5.5. Mitochondrial Crosstalk
- 1.3. Signaling Routes
  - 1.3.1 Second Messengers
  - 1.3.2 Steroid Hormones
  - 1.3.3 AMPK
  - 1.3.4 NAD+
  - 1.3.5 PGC1
- 1.4. Skeletal Muscle
  - 1.4.1 Structure and Function
  - 1.4.2 Fibers
  - 1.4.3 Innervation
  - 1.4.4 Muscle Cytoarchitecture
  - 1.4.5 Protein Synthesis and Breakdown
  - 1.4.6. mTOR
- 1.5. Neuromuscular Adaptations
  - 1.5.1 Motor Unit Recruitment
  - 1.5.2 Synchronization
  - 1.5.3 Neural Drive
  - 1.5.4 Golgi Tendon Organ and Neuromuscular Spindle
- 1.6. Structural Adaptations
  - 1.6.1 Hypertrophy
  - 1.6.2 Signal Mechanotranslation
  - 1.6.3 Metabolic Stress
  - 1.6.4 Muscle Damage and Inflammation
  - 1.6.5 Changes in Muscular Architecture
- 1.7. Fatigue
  - 1.7.1 Central Fatigue
  - 1.7.2 Peripheral Fatigue
  - 1.7.3 HRV
  - 1.7.4 Bioenergetic Model
  - 1.7.5 Cardiovascular Model
  - 1.7.6 Thermoregulator Model
  - 1.7.7 Psychological Model
  - 1.7.8 The Center Governor Model



- 1.8. Maximum Oxygen Consumption
    - 1.8.1 Maximum Oxygen Consumption
    - 1.8.2 Assessment
    - 1.8.3 VO<sub>2</sub> Kinetics
    - 1.8.4 VAM
    - 1.8.5 Running Economics
  - 1.9. Thresholds
    - 1.9.1 Lactate and Ventilatory Threshold
    - 1.9.2 MLSS
    - 1.9.3 Critical Power
    - 1.9.4 HIIT and LIT
    - 1.9.5 Anaerobic Speed Reserve
  - 1.10. Extreme Physiological Conditions
    - 1.10.1 Height
    - 1.10.2 Temperature
    - 1.10.3 Diving
- Module 2. Logistics and Administrative Role of the Indoor Instructor**
- 2.1. Income and Expense Control
    - 2.1.1 Spreadsheet Management
    - 2.1.2 Automated Income and Expense control Systems
  - 2.2. Proposed Activities
    - 2.2.1 Variety of Proposals and Disciplines of a Gym
    - 2.2.2 Rooms Inside a Gym
      - 2.2.2.1. Weight Room
      - 2.2.2.2. Group Activities Room
      - 2.2.2.3. Indoor Cycling Room
      - 2.2.2.4. Pilates Room
      - 2.2.2.5. Rehabilitation or Therapy Room
  - 2.3. Credits and Accounting Logistics
    - 2.3.1 Organization of Activity Costs
    - 2.3.2 Proposed Plans Linking Different Activities
  - 2.4. Input and Data Sheets
    - 2.4.1 Physical Control of Customer Entry
    - 2.4.2 Digitized Control of Customer Entry
  - 2.5. Social Networks and Outreach
    - 2.5.1 Management of Instagram and Facebook to Advertise Gym Activities
    - 2.5.2 Simple Design of Publications About Gym Activities and Events on Social Networks
  - 2.6. Professional Meetings
    - 2.6.1 Strategies Needed to Convene Professionals in Each Sector in Person
    - 2.6.2 Virtual Strategies for Information Management Among Professionals in each Sector
  - 2.7. Cleaning and Maintenance
    - 2.7.1 Development of a Schedule for General Cleaning and Sanitization of Work Tools
    - 2.7.2 Implementation of a Control and Maintenance System for the Operation of the Gym Facilities
  - 2.8. Health and Safety Supplies
    - 2.8.1 Basic Knowledge of Internal Security Instruments
    - 2.8.2 Basic Knowledge of General Hygiene Measures
  - 2.9. Relationship between Activity Proposal and Customer Profile
    - 2.9.1 Different Potential Customer Profiles
    - 2.9.2 Activities Linked to Each Profile
  - 2.10. Essential Elements and/or Materials
    - 2.10.1 Detail of Basic Elements that Will Be Necessary for the Correct Development of the Different Activities
    - 2.10.2 Functions and Uses of Commonly Used Elements

## Module 3. Mobility Training

- 3.1. Neuromuscular System
  - 3.1.1 Neurophysiological Principles: Inhibition and Excitability
    - 3.1.1.1. Adaptations of the Nervous System
    - 3.1.1.2. Strategies to Modify Corticospinal Excitability
    - 3.1.1.3. Keys to Neuromuscular Activation
  - 3.1.2 Somatosensory Information Systems
    - 3.1.2.1. Information Subsystems
    - 3.1.2.2. Types of Reflexes
      - 3.1.2.2.1. Monosynaptic Reflexes
      - 3.1.2.2.2. Polysynaptic Reflexes
      - 3.1.2.2.3. Musculotendinous-Articular Reflexes
    - 3.1.2.3. Responses to Dynamic and Static Stretches
- 3.2. Motor Control and Movement
  - 3.2.1 Stabilizing and Mobilising Systems
    - 3.2.1.1. Local System: Stabilizer System
    - 3.2.1.2. Global System: Mobilizing System
    - 3.2.1.3. Respiratory Pattern
  - 3.2.2 Movement Pattern
    - 3.2.2.1. Coactivation
    - 3.2.2.2. Joint by Joint Theory
    - 3.2.2.3. Primary Motion Complexes
- 3.3. Understanding Mobility
  - 3.3.1 Key Concepts and Beliefs in Mobility
    - 3.3.1.1. Manifestations of Mobility in Sport
    - 3.3.1.2. Neurophysiological and Biomechanical Factors Influencing Mobility Development
    - 3.3.1.3. Impact of Mobility on Strength Development
  - 3.3.2 Objectives of Training Mobility in Sport
    - 3.3.2.1. Mobility in the Training Session
    - 3.3.2.2. Benefits of Mobility Training



- 3.3.3 Mobility and Stability by Structures
  - 3.3.3.1. Foot-Ankle Complex
  - 3.3.3.2. Knee-Hip Complex
  - 3.3.3.3. Spine-Shoulder Complex
- 3.4. Training Mobility
  - 3.4.1 Fundamental Block
    - 3.4.1.1. Strategies and Tools to Optimize Mobility
    - 3.4.1.2. Specific Pre-Exercise Plan
    - 3.4.1.3. Specific Post-Exercise Plan
  - 3.4.2 Mobility and Stability in Basic Movements
    - 3.4.2.1. Squat & Dead Lift
    - 3.4.2.3. Acceleration and Multidirection
- 3.5. Methods of Recovery
  - 3.5.1 Proposal for Effectiveness Based on Scientific Evidence
- 3.6. Methods for Training Mobility
  - 3.6.1 Tissue-Centered Methods: Passive Tension and Active Tension Stretching
  - 3.6.2 Methods Focused on Arthrocinematics: Isolated Stretches and Integrated Stretches
  - 3.6.3 Eccentric Training
- 3.7. Mobility Training Program
  - 3.7.1 Effects of Stretching in the Short and Long Term
  - 3.7.2 Optimal Timing for Applying Stretching
- 3.8. Athlete Assessment and Analysis
  - 3.8.1 Functional and Neuromuscular Assessment
    - 3.8.1.1. Assessment
    - 3.8.1.2. Assessment Process
      - 3.8.1.2.1. Analyze the Movement Pattern
      - 3.8.1.2.2. Identify the Test
      - 3.8.1.2.3. Detect the Weak Links
  - 3.8.2 Athlete Assessment Methodology
    - 3.8.2.1. Types of Tests
      - 3.8.2.1.1. Analytical Assessment Test
      - 3.8.2.1.2. General Assessment Test
      - 3.8.2.1.3. Specific-Dynamic Assessment Test

- 3.8.2.2. Assessment by Structures
  - 3.8.2.2.1. Foot-Ankle Complex
  - 3.8.2.2.2. Knee-Hip Complex
  - 3.8.2.2.3. Spine-Shoulder Complex
- 3.9. Mobility in Injured Athletes
  - 3.9.1 Pathophysiology of Injury: Effects on Mobility
    - 3.9.1.1. Muscle Structure
    - 3.9.1.2. Tendon Structure
    - 3.9.1.3. Ligament Structure
  - 3.9.2 Mobility and Prevention of Injuries: Practical Case
    - 3.9.2.1. Ruptured Ischialis in the Runner

## Module 4. Group Classes

- 4.1. Principles of Training
  - 4.1.1 Functional Unit
  - 4.1.2 Multilaterality
  - 4.1.3 Specificity
  - 4.1.4 Overload
  - 4.1.5 Continuity
  - 4.1.6 Progression
  - 4.1.7 Recuperation
  - 4.1.8 Individuality
- 4.2. Controlling the Load
  - 4.2.1 Internal Load
  - 4.2.2 External Load
- 4.3. Stretching
  - 4.3.1 Stretching
  - 4.3.2 Objectives of Stretching
  - 4.3.3 Pedagogical Organization of the Stretching Class
- 4.4. Gluteus, Abdomen and Legs (GAL)
  - 4.4.1 Objectives of a GAL Class
  - 4.4.2 Pedagogical Organization of the GAL Class
  - 4.4.3 External Load in the GAL Class

- 4.5. Floor Pilates
  - 4.5.1 Features of the Pilates Mat
  - 4.5.2 Pilates Mat Exercises and Movement Suggestions
  - 4.5.3 Training Load in a Pilates Mat Class
- 4.6. Rhythms
  - 4.6.1 Types of Classes
  - 4.6.2 Features of Rhythm Classes
  - 4.6.3 Pedagogical Proposals for the Development of a Rhythm Class
- 4.7. Non-Conventional Classes
  - 4.7.1 Characteristics of Non-Conventional Training
  - 4.7.2 Exercise Proposals
  - 4.7.3 Pedagogical Organization of a Non-Conventional Training Class
- 4.8. Functional Training
  - 4.8.1 Functional Training
  - 4.8.2 Pedagogical Organization of the Functional Training Class
  - 4.8.3 Use of Internal Load
- 4.9. Aerobic
  - 4.9.1 Type of Aerobic Fitness Classes
  - 4.9.2 Pedagogical Structure of the Class
- 4.10. Indoor Cycling
  - 4.10.1 Birth of the Specialty in Gyms
  - 4.10.2 Indoor Cycling in Health
  - 4.10.3 Structure of an Indoor Cycling Class
- 4.11. Classes for Older Adults
  - 4.11.1 Profile of the Older Adults Group
  - 4.11.2 Benefits of Physical Activity in Older Adults
  - 4.11.3 Structure of a Group Class with Older Adults
- 4.12. Classes for Older Adults
  - 4.12.1 History of Yoga
  - 4.12.2 Yoga and Health

## Module 5. Obesity and Physical Exercise

- 5.1. Obesity
  - 5.1.1 Evolution of Obesity: Associated Cultural and Social Aspects
  - 5.1.2 Obesity and Co-Morbidities: The Role of Interdisciplinarity
  - 5.1.3 Childhood Obesity and its Impact on Future Adults
- 5.2. Pathophysiological Bases
  - 5.2.1 Obesity and Health Risks
  - 5.2.2 Pathophysiological Aspects of Obesity
  - 5.2.3 Obesity and Associated Pathologies
- 5.3. Assessment and Diagnosis
  - 5.3.1 Body Composition: 2-Component and 5-Component Model
  - 5.3.2 Assessment: Main Morphological Evaluations
  - 5.3.3 Interpretation of Anthropometric Data
  - 5.3.4 Prescription of Physical Exercise for the Prevention and Improvement of Obesity
- 5.4. Protocols and Treatments
  - 5.4.1 First Therapeutic Guideline: Lifestyle Modification
  - 5.4.2 Nutrition: Role in Obesity
  - 5.4.3 Exercise: Role in Obesity
  - 5.4.4 Medical Treatment
- 5.5. Training Planning in Patients with Obesity
  - 5.5.1 Customer Level Specification
  - 5.5.2 Objectives
  - 5.5.3 Assessment Processes
  - 5.5.4 Operability with Respect to Spatial and Material Resources
- 5.6. Strength Training Programming in Obese Patients
  - 5.6.1 Objectives of Strength Training in Obese People
  - 5.6.2 Volume, Intensity and Recovery of Strength Training in Obese Individuals
  - 5.6.3 Selection of Exercises and Methods of Strength Training in Obese People
  - 5.6.4 Design of Strength Training Programs in Obese People

- 5.7. Programming of Resistance Training in the Obese Patient
  - 5.7.1 Objectives of Resistance Training in Obese People
  - 5.7.2 Volume and Intensity and Recovery from Resistance Training in Obese People
  - 5.7.3 Selection of Exercises and Methods of Resistance Training in Obese People
  - 5.7.4 Design of Resistance Training Programs for Obese People
- 5.8. Joint Health and Complementary Training in Obese Patients
  - 5.8.1 Complementary Training in Obesity
  - 5.8.2 Range of Motion (ROM)/flexibility Training in Obese People
  - 5.8.3 Improved Trunk Control and Stability in Obese People
  - 5.8.4 Other Training Considerations for the Obese Population
- 5.9. Psychosocial Aspects of Obesity
  - 5.9.1 Importance of Interdisciplinary Treatment in Obesity
  - 5.9.2 Eating Disorders
  - 5.9.3 Childhood Obesity
  - 5.9.4 Adult Obesity
- 5.10. Nutrition and Other Factors Related to Obesity
  - 5.10.1 Omic Sciences and Obesity
  - 5.10.2 Microbiota and its Influence on Obesity
  - 5.10.3 Protocols for Obesity Nutritional Intervention: Evidence
  - 5.10.4 Nutritional Recommendations for the Practice of Physical Exercise

## Module 6. Physical Exercise in Children, Adolescents and Older Adults

- 6.1. Physical Exercise in Children and Adolescents
  - 6.1.1 Growth, Maturation and Development
  - 6.1.2 Development and Individuality: Chronological Age vs. Biological Age
  - 6.1.3 Sensitive Phases
  - 6.1.4 Long-Term Development (Long-term Athlete Development)
- 6.2. Physical Fitness Assessment in Children and Adolescents
  - 6.2.1 Main Assessment Tools
  - 6.2.2 Assessment of Coordinative Capacities
  - 6.2.3 Assessment of Conditional Capacities
  - 6.2.4 Morphological Assessments

- 6.3. Physical Exercise Planning for Children and Adolescents
  - 6.3.1 Muscle Strength Training
  - 6.3.2 Aerobic Fitness Training
  - 6.3.3 Speed Training
  - 6.3.4 Flexibility Training
- 6.4. Neurosciences and Child and Adolescent Development
  - 6.4.1 Neurolearning in Childhood
  - 6.4.2 Motor Skills. Basis of Intelligence
  - 6.4.3 Attention and Emotion. Early Learning
  - 6.4.4 Neurobiology and Epigenetic Theory in Learning
- 6.5. Approach to Physical Exercise in the Older Adult
  - 6.5.1 Aging Process
  - 6.5.2 Morphofunctional Changes in the Older Adult
  - 6.5.3 Objectives of Physical Exercise in the Older Adult
  - 6.5.4 Benefits of Physical Exercise in the Older Adult
- 6.6. Comprehensive Gerontological Assessment
  - 6.6.1 Coordination Skills Test
  - 6.6.2 Katz Index of Independence in Activities of Daily Living
  - 6.6.3 Test of Conditioning Capacities
  - 6.6.4 Fragility and Vulnerability in Older Adults
- 6.7. Instability Syndrome
  - 6.7.1 Epidemiology of Elderly Woman Obesity
  - 6.7.2 Detection of Patients at Risk without a Previous Fall
  - 6.7.3 Risk Factors for Falls in the Elderly
  - 6.7.4 Post-Fall Syndrome
- 6.8. Nutrition in Children, Adolescents and Older Adults
  - 6.8.1 Nutritional Requirements for Each Stage of Life
  - 6.8.2 Increased Prevalence of Childhood Obesity and Type 2 Diabetes in Children
  - 6.8.3 Association of Degenerative Diseases with Saturated Fat Consumption
  - 6.8.4 Nutritional Recommendations for the Practice of Physical Exercise

- 6.9. Neurosciences and Older Adults
  - 6.9.1 Neurogenesis and Learning
  - 6.9.2 Cognitive Reserve in Older Adults
  - 6.9.3 We Can Always Learn
  - 6.9.4 Aging is not Synonymous with Disease
  - 6.9.5 Alzheimer's and Parkinson's Disease, the Value of Physical Activity
- 6.10. Physical Exercise Planning for Older Adults
  - 6.10.1 Muscle Strength and Power Training
  - 6.10.2 Aerobic Fitness Training
  - 6.10.3 Cognitive Training
  - 6.10.4 Training Coordinative Capacities
  - 6.10.5 Conclusion and Closing of the Module

## Module 7. Physical Exercise and Pregnancy

- 7.1. Morphofunctional Changes in the Female Body during Pregnancy
  - 7.1.1 Body Mass Modification
  - 7.1.2 Modification of the Center of Gravity and Relevant Postural Adaptations
  - 7.1.3 Cardiorespiratory Adaptations
  - 7.1.4 Hematological Adaptations
  - 7.1.5 Adaptations of the Locomotor System
  - 7.1.6 Gastrointestinal and Renal Modifications
- 7.2. Pathophysiologies Associated with Pregnancy
  - 7.2.1 Gestational Diabetes Mellitus
  - 7.2.2 Supine Hypotensive Syndrome
  - 7.2.3 Anemia
  - 7.2.4 Lumbalgias
  - 7.2.5 Diastasis Recti
  - 7.2.6 Varicose Veins.
  - 7.2.7 Pelvic Floor Dysfunction
  - 7.2.8 Nerve Compression Syndrome





- 7.3. Kinefilaxia and Benefits of Physical Exercise in Pregnant Women
  - 7.3.1 Care to Be Taken into Account During Activities of Daily Life
  - 7.3.2 Preventive Physical Work
  - 7.3.3 Biological and Psychosocial Benefits of Physical Exercise
- 7.4. Risks and Contraindications of Physical Exercise in Pregnant Women
  - 7.4.1 Absolute Contraindications to Physical Exercise
  - 7.4.2 Relative Contraindications to Physical Exercise
  - 7.4.3 Precautions to be Taken into Account During Pregnancy
- 7.5. Nutrition in Pregnant Women
  - 7.5.1 Body Mass Weight Gain with Pregnancy
  - 7.5.2 Energy Requirements Throughout Pregnancy
  - 7.5.3 Nutritional Recommendations for the Practice of Physical Exercise
- 7.6. Training Planning for Pregnant Women
  - 7.6.1 First Quarter Planning
  - 7.6.2 Second Quarter Planning
  - 7.6.3 Third Quarter Planning
- 7.7. Musculoskeletal Training Programs
  - 7.7.1 Motor Control
  - 7.7.2 Stretching and Muscle Relaxation
  - 7.7.3 Muscle Fitness Work
- 7.8. Programming Speed Training
  - 7.8.1 Modality of Low-Impact Physical Work
  - 7.8.2 Weekly Workload
- 7.9. Postural and Preparatory Labor for Childbirth
  - 7.9.1 Pelvic Floor Exercises
  - 7.9.2 Postural Exercises
- 7.10. Return to Physical Activity after Giving Birth
  - 7.10.1 Medical Discharge and Recovery Period
  - 7.10.2 Care at the Beginning of Physical Activity
  - 7.10.3 Conclusions and Closing of the Module

## Module 8. Sports Performance Assessment

- 8.1. Assessment
  - 8.1.1 Test, Assessment, Measurement
  - 8.1.2 Validity, Reliability
  - 8.1.3 Purposes of the Evaluation
- 8.2. Types of Tests
  - 8.2.1 Laboratory Test
    - 8.2.1.1. Strengths and Limitations of Laboratory Tests
  - 8.2.2 Field Tests
    - 8.2.2.1. Strengths and Limitations of Field Tests
  - 8.2.3 Direct Tests
    - 8.2.3.1. Applications and Transfer to Training
  - 8.2.4 Indirect Tests
    - 8.2.4.1. Practical Considerations and Transfer to Training
- 8.3. Assessment of Body Composition
  - 8.3.1 Bioimpedance
    - 8.3.1.1. Considerations in its Application to Field
    - 8.3.1.2. Limitations on the Validity of Its Data
  - 8.3.2 Anthropometry
    - 8.3.2.1. Tools for its Implementation
    - 8.3.2.2. Models of Analysis for Body Composition
  - 8.3.3 Body Mass Index (IMC)
    - 8.3.3.1. Restrictions on the Data Obtained for the Interpretation of Body Composition
- 8.4. Assessing Aerobic Fitness
  - 8.4.1 Vo2max Test on the Treadmill
    - 8.4.1.1. Astrand Test
    - 8.4.1.2. Balke Test
    - 8.4.1.3. ACSM Test
    - 8.4.1.4. Bruce Test
    - 8.4.1.5. Foster Test
    - 8.4.1.6. Pollack Test
  - 8.4.2 Cycloergometer VO2max Test
    - 8.4.2.1. Astrand Rhyming Test
    - 8.4.2.2. Fox Test
  - 8.4.3 Cycloergometer Power Test
    - 8.4.3.1. Wingate Test
  - 8.4.4 Vo2max Test in the Field
    - 8.4.4.1. Leger Test
    - 8.4.4.2. Montreal University Test
    - 8.4.4.3. 1-MR Test
    - 8.4.4.4. 12-Minute Test
    - 8.4.4.5. 2.4-Kilometer Test
  - 8.4.5 Field Test to Establish Training Areas
    - 8.4.5.1. 30-15 Test IFT
  - 8.4.6 UNCa Test
  - 8.4.7 Yo-Yo Test
    - 8.4.7.1. Yo-Yo Endurance YYET Level 1 and 2
    - 8.4.7.2. Yo-Yo Intermittent Endurance YYEIT Level 1 and 2
    - 8.4.7.3. Yo-Yo Intermittent Recovery YYERT Level 1 and 2
- 8.5. Neuromuscular Fitness Evaluation
  - 8.5.1 Submaximal Repetition Test
    - 8.5.1.1. Practical Applications for its Assessment
    - 8.5.1.2. Validated Estimation Formulas for the Different Training Exercises
  - 8.5.2 1-MR Limitations
    - 8.5.2.1. Protocol for its Performance
    - 8.5.2.2. 1MR Valuation Limitations
  - 8.5.3 Horizontal Jump Test
    - 8.5.3.1. Assessment Protocols
  - 8.5.4 Speed Test (5m,10m,15m, Etc.)
    - 8.5.4.1. Considerations on the Data Obtained in Time/Distance Assessments
  - 8.5.5 Maximum/Sub-maximum Incremental Progressive Tests
    - 8.5.5.1. Validated Protocols
    - 8.5.5.2. Practical Applications
  - 8.5.6 Vertical Jump Test



- 8.5.6.1. SJ Jump
- 8.5.6.2. CMJ Jump
- 8.5.6.3. ABK Jump
- 8.5.6.4. DJ Test
- 8.5.6.5. Continuous Jump Test
- 8.5.7. Strength/Speed Vertical/Horizontal Profiles
  - 8.5.7.1. Morin and Samozino Assessment Protocols
  - 8.5.7.2. Practical Applications from a Strength/Speed Profile
- 8.5.8. Isometric Tests With Load Cell
  - 8.5.8.1. Voluntary Isometric Maximal Strength Test (IMS)
  - 8.5.8.2. Bilateral Deficit Isometry Test (%BLD)
  - 8.5.8.3. Lateral Deficit (%LD)
  - 8.5.8.4. Hamstring/Quadriceps Ratio Test
- 8.6. Assessment and Monitoring Tools
  - 8.6.1. Heart Rate Monitors
    - 8.6.1.1. Device Characteristics
    - 8.6.1.2. Training Areas by Heart Rate
  - 8.6.2. Lactate Analyzers
    - 8.6.2.1. Device Types, Performance and Characteristics
    - 8.6.2.2. Training Zones According to the Lactate Threshold Limit (LT)
  - 8.6.3. Gas Analyzers
    - 8.6.3.1. Laboratory vs Portable Devices
  - 8.6.4. GPS
    - 8.6.4.1. GPS Types, Characteristics, Strengths and Limitations
    - 8.6.4.2. Metrics Established to Interpret the External Load
  - 8.6.5. Accelerometers
    - 8.6.5.1. Types of Accelerometers and Characteristics
    - 8.6.5.2. Practical Applications of Data Obtained From an Accelerometer
  - 8.6.6. Position Transducers
    - 8.6.6.1. Types of Transducers for Vertical and Horizontal Movements
    - 8.6.6.2. Variables Measured and Estimated by of a Position Transducer
    - 8.6.6.3. Data Obtained from a Position Transducer and its Applications to Training Programming
  - 8.6.7. Strength Platforms
    - 8.6.7.1. Types and Characteristics of Strength Platforms
    - 8.6.7.2. Variables Measured and Estimated by Means of a Strength Platform
    - 8.6.7.3. Practical Approach to Training Programming
  - 8.6.8. Load Cells
    - 8.6.8.1. Cell Types, Characteristics and Performance
    - 8.6.8.2. Uses and Applications for Sports Performance and Health
  - 8.6.9. Photoelectric Cells
    - 8.6.9.1. Characteristics, and Limitations of the Devices
    - 8.6.9.2. Practical Uses and Applicability
  - 8.6.10. Mobile Applications
    - 8.6.10.1. Description of the Most Used Apps on the Market: My Jump, PowerLift, Runmatic, Nordic
- 8.7. Internal and External Load
  - 8.7.1. Objective Means of Assessment
    - 8.7.1.1. Speed of Execution
    - 8.7.1.2. Average Mechanical Power
    - 8.7.1.3. GPS Device Metrics
  - 8.7.2. Subjective Means of Assessment
    - 8.7.2.1. PSE
    - 8.7.1.2. sPSE
    - 8.7.1.3. Chronic/Acute Load Ratio

- 8.8. Fatigue
  - 8.8.1 Fatigue and Recovery
  - 8.8.2 Assessments
    - 8.8.2.1. Laboratory Objectives: CK, Urea, Cortisol, Etc.
    - 8.8.2.2. Field Objectives: CMJ, Isometric Tests, etc.
    - 8.8.2.3. Subjective: Wellness Scales, TQR, etc.
  - 8.8.3 Recovery Strategies: Cold-Water Immersion, Nutritional Strategies, Self-Massage, Sleep
- 8.9. Considerations for Practical Applications
  - 8.9.1 Vertical Jump Test Practical Applications
  - 8.9.2 Maximum/Sub-maximum Incremental Progressive Test Practical Applications
  - 8.9.3 Vertical Strength-Speed Profile. Practical Applications

## Module 9. Strength Training

- 9.1. Strength
  - 9.1.1 Strength from Mechanics
  - 9.1.2 Strength from Physiology
  - 9.1.3 Applied Strength
  - 9.1.4 Time-Strength Curve
    - 9.1.4.1. Interpretation
  - 9.1.5 Maximum Strength Training
  - 9.1.6 RFD
  - 9.1.7 Useful Strength
  - 9.1.8 Strength- Speed-Power Curves
    - 9.1.8.1. Interpretation
  - 9.1.9 Strength Deficit
- 9.2. Training Load
  - 9.2.1 Strength Training Load
  - 9.2.2 The Load
  - 9.2.3 The Load: Volume
  - 9.2.4 The Load: Intensity
  - 9.2.5 The Load: Density
  - 9.2.6 Nature of the Effort

- 9.3. Strength Training in the Prevention and Rehabilitation of Injuries
  - 9.3.1 Prevention and Rehabilitation of Injuries
    - 9.3.1.1. Terminology.
    - 9.3.1.2. Concepts
  - 9.3.2 Strength Training and Injury Prevention and Rehabilitation Based on Scientific Evidence
  - 9.3.3 Methodological Process of Strength Training in Injury Prevention and Functional Recovery
    - 9.3.3.1. The Method
    - 9.3.3.2. Applying the Method in Practice
  - 9.3.4 Role of Core Stability (CORE) in Injury Prevention
    - 9.3.4.1. CORE
    - 9.3.4.2. CORE Training
- 9.4. Plyometric Method
  - 9.4.1 Physiological Mechanisms
  - 9.4.2 Muscle Actions in Plyometric Exercises
  - 9.4.3 The Stretch- Shortening Cycle (SSC)
    - 9.4.3.1. Use of Energy or Elastic Capacity
    - 9.4.3.2. Reflex Involvement Series and Parallel Elastic Energy Accumulation
  - 9.4.4 SSC Classification Scheme
    - 9.4.4.1. Short SSC
    - 9.4.4.2. Long SSC
  - 9.4.5 Properties of the Muscle and Tendon
  - 9.4.6 Central Nervous System
    - 9.4.6.1. Recruitment
    - 9.4.6.2. Frequency (F)
    - 9.4.6.3. Synchronization
- 9.5. Power Training
  - 9.5.1 Power
    - 9.5.1.1. Power
    - 9.5.1.2. Importance of Power in the Context of Sports Performance
    - 9.5.1.3. Clarification of Power-Related Terminology
  - 9.5.2 Factors Contributing to Peak Power Development



- 9.5.3 Structural Aspects Conditioning Power Production
  - 9.5.3.1. Muscle Hypertrophy
  - 9.5.3.2. Muscle Structure
  - 9.5.3.3. Ratio of Fast and Slow Fibers in a Cross Section
  - 9.5.3.4. Muscle Length and its Effect on Muscle Contraction
  - 9.5.3.5. Quantity and Characteristics of Elastic Components
- 9.5.4 Neural Aspects Conditioning Power Production
  - 9.5.4.1. Action Potential
  - 9.5.4.2. Speed of Motor Unit Recruitment
  - 9.5.4.3. Muscle Coordination
  - 9.5.4.4. Intermuscular Coordination
  - 9.5.4.5. Previous Muscle Status (PAP)
  - 9.5.4.6. Neuromuscular Reflex Mechanisms and Their Incidence
- 9.5.5 Theoretical Aspects for Understanding the Strength-Time Curve
  - 9.5.5.1. Strength Impulse
  - 9.5.5.2. Phases of the Strength-Time Curve
  - 9.5.5.3. Phases of Acceleration in the Strength-Time Curve
  - 9.5.5.4. Maximum Acceleration Area of the Strength-Time Curve
  - 9.5.5.5. Deceleration Phase of the Strength-Time Curve
- 9.5.6 Theoretical Aspects for Understanding Power Curves
  - 9.5.6.1. Energy-Time Curve
  - 9.5.6.2. Energy-Displacement Curve
  - 9.5.6.3. Optimal Workload for Maximum Power Development
- 9.6. Vector Strength Training
  - 9.6.1 The Force Vector
    - 9.6.1.1. Axial Vector
    - 9.6.1.2. Horizontal Vector
    - 9.6.1.3. Rotational Vector
  - 9.6.2 Benefits of Using this Terminology
  - 9.6.3 Basic Vectors in Training
    - 9.6.3.1. The Main Sporting Gestures
    - 9.6.3.2. The Main Overload Exercises
    - 9.6.3.3 The Main Training Exercises

- 9.7. Main Methods for Strength Training
  - 9.7.1 Own Body Weight
  - 9.7.2 Free Exercises
  - 9.7.3 PAP
    - 9.7.3.1. Definition
    - 9.7.3.2. Application of PAP Prior to Energy-Related Sports Disciplines
  - 9.7.4 Exercises with Machines
  - 9.7.5 Complex Training
  - 9.7.6 Exercises and Their Transfer
  - 9.7.7 Contrasts
  - 9.7.8 Cluster Training
- 9.8. VBT
  - 9.8.1 Applying VBT
    - 9.8.1.1. Degree of Stability of Execution Speed with Each Percentage of 1MR
  - 9.8.2 Scheduled Load and Actual Load
    - 9.8.2.1. Variables Involved in the Difference Between Programmed Load and Actual Training Load
  - 9.8.3 VBT as a Solution to the Problem of Using 1MR and nMR to Program Loads
  - 9.8.4 VBT and Degree of Fatigue
    - 9.8.4.1. Connection to Lactate
    - 9.8.4.2. Connection to Ammonium
  - 9.8.5 VBT in Relation to the Loss of Speed and Percentage of Repetitions Performed
    - 9.8.5.1. Define the Different Degrees of Effort in the Same Series
    - 9.8.5.2. Different Adaptations According to the Degree of Speed Loss in the Series
  - 9.8.6 Methodological Proposals According to Different Authors
- 9.9. Strength in Connection to Hypertrophy
  - 9.9.1 Hypertrophy-Inducing Mechanism: Mechanical Stress
  - 9.9.2 Hypertrophy-Inducing Mechanism: Metabolic Stress
  - 9.9.3 Hypertrophy-Inducing Mechanism: Muscle Damage
  - 9.9.4 Hypertrophy Programming Variables
    - 9.9.4.1. Frequency (F)
    - 9.9.4.2. Volume

- 9.9.4.3. Intensity
- 9.9.4.4. Cadence
- 9.9.4.5. Series and Repetitions
- 9.9.4.6. Density
- 9.9.4.7. Order in the Execution of Exercises
- 9.9.5 Training Variables and Their Different Structural Effects
  - 9.9.5.1. Effect on Different Types of Fiber
  - 9.9.5.2. Effects on the Tendon
  - 9.9.5.3. Fascicle Length
  - 9.9.5.4. Peneation Angle
- 9.10. Eccentric Strength Training
  - 9.10.1 Eccentric Training
    - 9.10.1.1. Eccentric Training
    - 9.10.1.2. Different Types of Eccentric Training
  - 9.10.2 Eccentric Training and Performance
  - 9.10.3 Eccentric Training in the Prevention and Rehabilitation of Injuries
  - 9.10.4 Technology Applied to Eccentric Training
    - 9.10.4.1. Conical Pulleys
    - 9.10.4.2. Isoinertial Devices

## Module 10. Indoor Targeted Personal Training

- 10.1. Metabolic Syndrome
  - 10.1.1 Metabolic Syndrome
  - 10.1.2 Epidemiology of Metabolic Syndrome
  - 10.1.3 The Patient with a Syndrome Considerations for Intervention
- 10.2. Pathophysiological Bases
  - 10.2.1 Definition of Metabolic Syndrome and Health Risks
  - 10.2.2 Pathophysiological Aspects of the Disease
- 10.3. Assessment and Diagnosis
  - 10.3.1 Metabolic Syndrome and its Assessment in the Clinical Setting
  - 10.3.2 Biomarkers, Clinical Indicators and Metabolic Syndrome

- 10.3.3 Metabolic Syndrome, Its Assessment and Follow-Up by the Physical Exercise Specialist
- 10.3.4 Diagnosis and Intervention Protocol for Metabolic Syndrome
- 10.4. Protocols and Treatments
  - 10.4.1 Lifestyle and Its Relationship with Metabolic Syndrome
  - 10.4.2 Nutrition and Its Importance in Metabolic Syndrome
  - 10.4.3 Exercise: Role with Metabolic Syndrome
  - 10.4.4 The Patient with Metabolic Syndrome and Pharmacologic Treatment: Considerations for the Exercise Professional.
- 10.5. Indoor Training Plan with Patients with Metabolic Syndrome
  - 10.5.1 Customer Level Specification
  - 10.5.2 Objectives
  - 10.5.3 Assessment Processes
  - 10.5.4 Operability with Respect to Spatial and Material Resources
- 10.6. Programming of Indoor Strength Training
  - 10.6.1 Objectives of Strength Training for Metabolic Syndrome
  - 10.6.2 Volume, Intensity and Recovery of Strength Training for Metabolic Syndrome
  - 10.6.3 Selection of Exercises and Methods of Strength Training for People with Metabolic Syndrome
  - 10.6.4 Design of Strength Training Programs for People with Metabolic Syndrome
- 10.7. Indoor Resistance Training Program
  - 10.7.1 Objectives of Resistance Training for Metabolic Syndrome
  - 10.7.2 Volume, Intensity and Recovery from Resistance Training for People with Metabolic Syndrome
  - 10.7.3 Choice of Exercises and Methods of Resistance Training for People with Metabolic Syndrome
  - 10.7.4 Design of Resistance Training Programs for People with Metabolic Syndrome
- 10.8. Precautions and Contraindications in Indoor Training
  - 10.8.1 Assessments for the Performance of Physical Exercise in the Population with Metabolic Syndrome
  - 10.8.2 Contraindications Regarding the Development of Activity in Patients with Metabolic Syndrome
- 10.9. Nutrition and Lifestyle in Patients with Metabolic Syndrome
  - 10.9.1 Nutritional Aspects in Metabolic Syndrome
  - 10.9.2 Examples of Nutritional Intervention in Metabolic Syndrome
- 10.10. Design of Indoor Training Programs for Patients with Metabolic Syndrome
  - 10.10.1 Design of Training Programs for People with Diabetes
  - 10.10.2 Design of Training Sessions for People with Diabetes
  - 10.10.3 Design of Comprehensive (Interdisciplinary and Multidisciplinary) Intervention Programs for People with Diabetes



*If you want to become one of the best Fitness Instructors, then this program is for you”*

06

# 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.

“

*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.



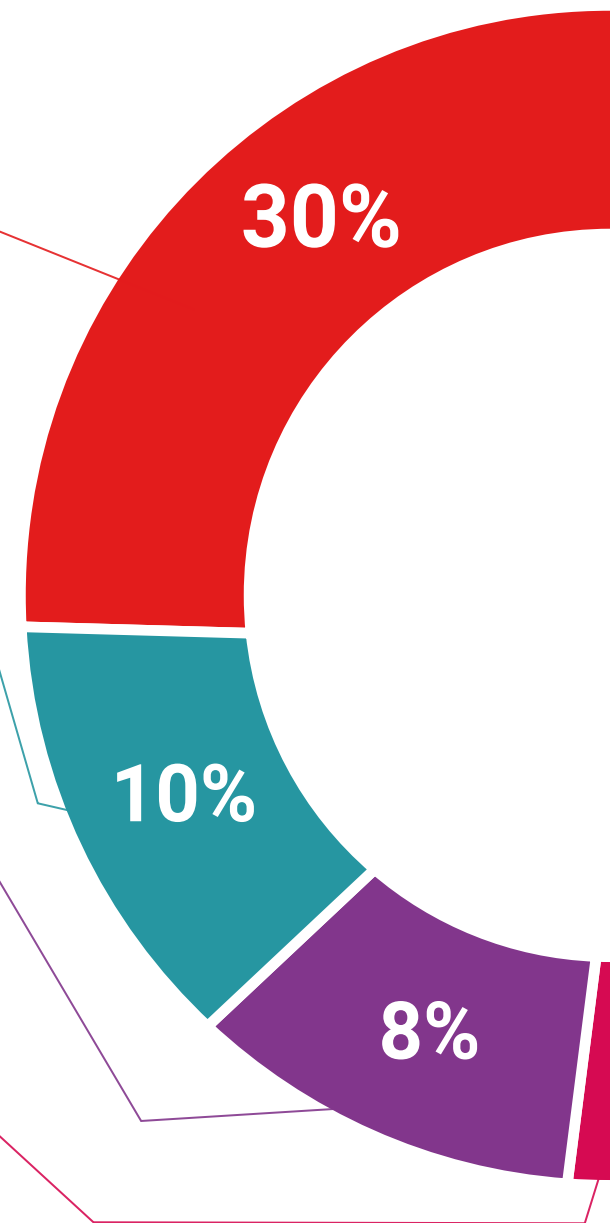
#### Practising Skills and Abilities

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.



# 07 Certificate

The Professional Master's Degree in Fitness Instructor guarantees students, in addition to the most rigorous and up-to-dated education, access to a Professional Master's Degree issued by TECH Technological University.



“

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

This **Professional Master's Degree in Fitness Instructor** contains the most complete and up-to-date scientific program on the market.

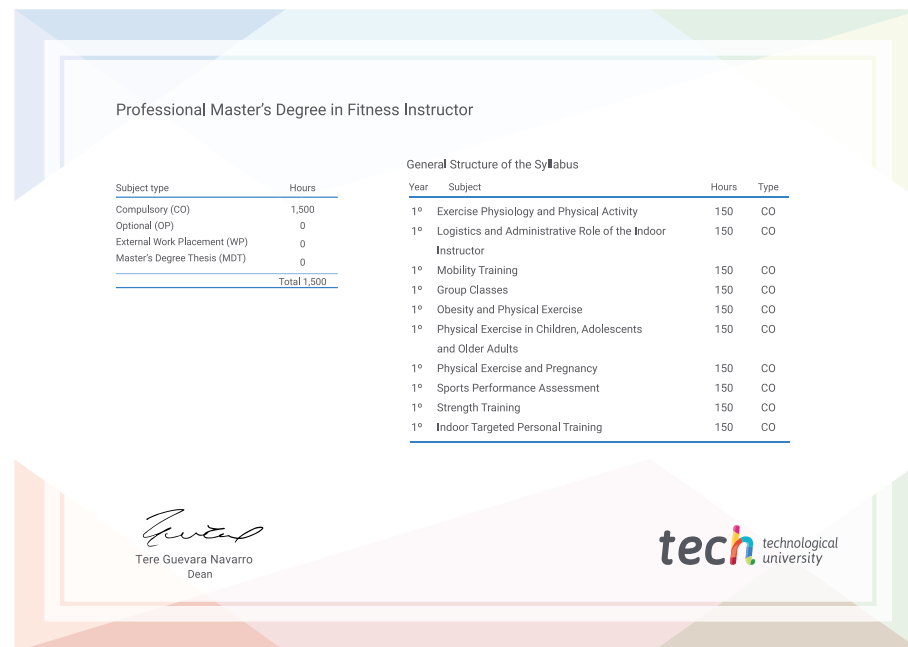
After the student has passed the assessments, they will receive their corresponding **Professional Master's Degree** issued by **TECH Technological University** via tracked delivery\*.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Professional Master's Degree, and meets the requirements commonly demanded by job exchanges, competitive examinations, and professional from career evaluation committees.

Title: **Professional Master's Degree in Gym Instructor**

Official N° of hours: **1,500 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



**Professional Master's  
Degree**  
Fitness Instructor

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

# Professional Master's Degree Fitness Instructor

Endorsed by the NBA

A photograph of a fitness instructor in a black jacket crouching in a gym, holding a clipboard and looking at a client's leg. The client is wearing black leggings and white sneakers with pink laces. The background shows other gym equipment and people.

**tech** technological  
university