



# Advanced Master's Degree High Performance and Competition Football

» Modality: online» Duration: 2 years

» Certificate: TECH Global University

» Credits: 120 ECTS

» Schedule: at your own pace

» Exams: online

Website: www.techtitute.com/us/sports-science/advanced-master-degree/advanced-master-degree-high-performance-competition-football

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## tech 06 | Introduction

In a world in constant evolution, football is facing new challenges. Teams must face an increasingly demanding and competitive struggle, where high sports performance is essential. Technology and science have transformed sport, generating a need for professionalization in the different aspects that make it up.

In this context, specialization in High Performance Football is essential for those who wish to excel in this sport. For this reason, TECH has created the Grand Master in High Performance and Competition Football, which is presented as a unique opportunity to acquire theoretical and practical knowledge that will improve the sporting performance of teams and players.

The program has a wide variety of topics covering exercise physiology and physical activity, biomechanics applied to high performance sports, planning applied to high performance sports, training methodology, physical preparation in football and football technique and tactics, among other areas.

Sports professionals who wish to specialize in high-performance football will be able to acquire specialized skills and knowledge in different areas, such as sports performance evaluation, statistics applied to performance and research, or psychology and nutrition applied to football.

The program offers a 100% online methodology, which allows students to access classes and study materials from anywhere in the world, without geographical or time constraints. In addition, students can adapt the pace of learning to their needs, ensuring a personalized and effective learning experience.

This Advances Master's Degree in High Performance and Competitive Football contains the most complete and up-to-date scientific program on the market. The most important features include:

- The development of case studies presented by experts in high performance football
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies in high competition 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



Develop your skills as a football professional with a program focused on the key areas of high performance sports"



Become a benchmark in the world of high performance football and lead highly effective teams and training plans with this Grand Master"

Its teaching staff includes professionals belonging to the field of football, who contribute their work experience to this program, as well as renowned specialists from leading companies 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 an immersive learning experience designed to prepare for real-life situations.

This program is designed around Problem-Based Learning, whereby the student 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.

Master the latest trends and technologies in training and sports performance with a complete and updated syllabus.

Study at your own pace and from anywhere, thanks to the 100% online methodology that adapts to your needs and schedules.







## tech 10 | Objectives



### **General Objectives**

- To know the origin, history and evolution of football
- Delve into the organization of a club and everything that surrounds the sporting environment
- Go deeper into current technical-tactical knowledge
- Investigate the change in football analysis with the introduction of new technologies
- Explain physical preparation and re-training as a fundamental part of today's football
- Highlight the importance of good nutrition for good sports performance
- Recognize each member of a coaching staff and their roles in a football club
- Delve into Psychology as a fundamental part of a football player's performance
- Master and apply with certainty the most current training methods to improve sports performance
- To effectively master statistics and thus be able to make a correct use of the data obtained from the athlete, as well as to initiate research processes
- Acquire knowledge based on the most current scientific evidence with full applicability in the practical field
- To master all the most advanced methods of sports performance evaluation
- Master the principles governing Exercise Physiology, as well as Biochemistry
- Master the principles governing Biomechanics applied directly to Sports Performance
- Master the principles governing Nutrition applied to sports performance
- Successfully integrate all the knowledge acquired in the different modules in real practice





#### Module 1. Exercise Physiology and Physical Activity

- Specialize and interpret key aspects of biochemistry and thermodynamics
- Gain in-depth knowledge of the energy metabolic pathways and their exercisemediated modifications and their role in human performance
- Learn 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
- Specialize in the functioning of the cardiovascular and respiratory systems and oxygen utilization during exercise
- Interpret the general causes of fatigue and impact in different types and modalities of exercise
- Interpret the different physiological milestones and their application in practice

#### Module 2. Biomechanics Applied to High Performance in Sports

- Specialize in the principles of Biomechanics oriented to physical education and Sport
- Apply the basic knowledge and technologies of biomechanics as a function of physical education, sport, performance and daily life
- Value the importance of protocols and the different types of biomechanical evaluation as a fundamental factor in the process of sports development and assessment
- Develop critical and analytical thinking that will allow him/her to generate innovative protocols and procedures, with different types of technology

#### Module 3. Planning Applied to High Performance in Sports

- Understand the internal logic of planning, such as its proposed core models
- Apply the Dose-Response concept in training
- Clearly differentiate the impact of programming with planning and its dependencies
- Acquire the ability to design different planning models according to the work reality
- Apply the concepts learned in an annual and/or multi-year planning design

#### Module 4. Structure and operation of a football team

- Know the organizational structure of a football club
- Differentiate between the different sporting bodies
- Distinguish functions between the different sporting and non-sporting areas

#### Module 5. Training methodology

- Master the different exercises for the maintenance of possession
- Describe the different recreational games in football
- Classify the various tasks within a training
- Design and plan training sessions

## tech 12 | Objectives

#### Module 6. Strength Training from Theory to Practice

- Correctly interpret all theoretical aspects defining strength and its components
- 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 athlete
- Master the theoretical and practical aspects that define power development
- Correctly apply strength training in the prevention and rehabilitation of injuries

#### Module 7. Speed Training from Theory to Practice

- Interpret the key aspects of speed and change of direction technique
- Compare and differentiate the speed of situational sport with respect to the track and field model
- Incorporate elements of observational judgment, a technique that allows discrimination of errors in the mechanics of the race and the procedures for their correction
- Become familiar with the bioenergetic aspects of single and repeated sprinting and how they relate to the training processes
- Differentiate the mechanical aspects that may influence performance impairment and the mechanisms of injury occurrence when sprinting
- Apply in an analytical way the different means and methods of training for the development of the different phases of speed
- Program speed training in situational sports

#### Module 8. Endurance Training from Theory to Practice

- Study the different adaptations generated by aerobic endurance
- Apply the physical demands of situational sports
- Carry out the different methods to organize training sessions
- Design training sessions taking into account the sport

#### Module 9. Mobility: from Theory to Performance

- 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
- Apply stabilizing and mobilizing systems within the movement pattern
- Unpack and specify the basic concepts and objectives related to mobility training
- Develop the ability to design tasks and plans for the development of manifestations of mobility
- Apply the different methods of performance optimization through recovery methods
- Develop the ability to carry out a functional and neuromuscular assessment of the athlete
- Recognize and address the effects produced by an injury at the neuromuscular level in the athlete

#### Module 10. Technical staff and coaching

- Deepen knowledge of the evolution of the technical staff's working methods
- Explain the different roles played by the various members of a team's staff
- To deepen in the figure of the goalkeeper and his training
- Analyze the new technologies used for the maintenance of football fields

#### Module 11. Physical Preparation in Football

- Provide specific and specialized training to students through scientific and practical support on the different contents of Physical Preparation and Injury Readaptation
- Raise awareness of the different roles of professionals in the field and the possibility of multidisciplinary work with the aim of improving the player's performance
- Know both analytical and integrated training methods with the objective of maximizing performance and preventing the risk of injury in football players
- Know the methods of injury rehabilitation in order to design, plan and develop rehabilitation processes for the most common injuries in football

#### Module 12. Technique in football

- To include technique in a game model
- Differentiate between collective and individual technical aspects
- Knowing how to plan training sessions based on technique
- Detecting micro technical details in a professional football player
- Knowledge of what the technique is for
- Give greater importance to technique in grassroots and professional football

#### Module 13. Tactics in football

- Mastering the different tactical concepts
- To deepen the different concepts to achieve a better tactical vision
- Expand and improve tactical knowledge
- Obtain tactical skills and adapt them to the different situations that arise in the game
- Acquire a tactical reasoning that allows to face the different situations of the game, both their own and the opponent's

#### Module 14. Analysis in football

- Know and recognize the functions of an analyst within a technical body, as well as the types of analysts that currently exist
- Knowing how to analyze individually and collectively both one's own team and the rivals
- Learn how to give opponent's information to the players
- We will learn the different phases of analysis of a match: Pre, During, Post and Final Evaluation of the match
- Learn to work with the technological tools available right now
- Tagging and recognizing the different events that occur during a football game

#### Module 15. Football injuries

- Know the most common injuries in professional footballIdentify extrinsic and intrinsic factors affecting injuries
- To deepen the figure and functions of physicians, physiotherapists and sports readaptators

#### Module 16. Sports Performance Assessment

- Become familiar with 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
- Apply different types of technologies currently used in the field of exercise assessment, whether in the field of health and fitness performance at any level of demand

#### Module 17. Statistics Applied to Performance and Research

- Develop the ability to analyze data collected in the laboratory and in the field through various assessment tools
- Describe the different types of statistical analysis and their application in various situations for the understanding of phenomena that occur during training
- Develop strategies for data exploration to determine the best models to describe them
- Establish the generalities of predictive models through regression analysis that favor the incorporation of different units of analysis in the training field
- Generate the conditions for the correct interpretation of results in different types of research

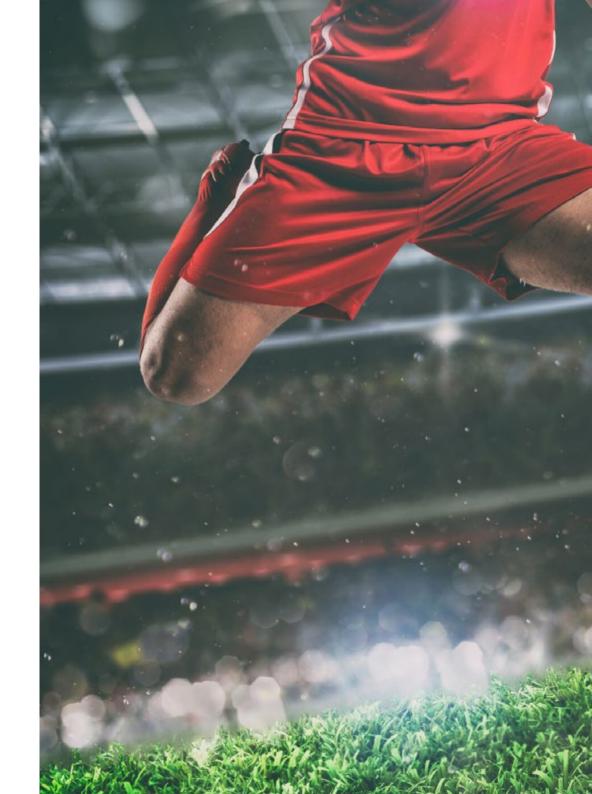
## tech 14 | Objectives

#### Module 18. Psychology applied to Football

- To establish and define clearly and concisely what Sports Psychology is and its usefulness in the world of Football
- To make an approach to the most influential and moldable psychological variables in football
- Provide group management tools

#### Module 19. Nutrition applied to football

- Understand the energy needs and requirements of the athlete, as well as the importance of nutrition for sports performance
- Distinguish the types of macronutrients and micronutrients and know their relevance in football
- To know the nutritional strategies for different situations of the football player
- To develop the clinical reasoning required for the planning of nutrition programs adapted to the football player







Learn in depth about the physiology of exercise and physical activity, in order to plan and design training programs tailored to the needs of each player"





## tech 18 | Skills



#### **General Skills**

- Acquire knowledge based on the most current scientific evidence with full applicability in the practical field
- To master all the most advanced methods of sports performance evaluation
- Planning a team's annual season
- Create and implement training sessions at the highest level in the world of football
- Leading and managing crisis situations in High Competition teams
- Coordinate all members of the technical staff, according to their specific functions
- Develop nutritional plans according to the level of demand of the competition
- Incorporate coaching techniques for individual and group motivation
- Improving relations between the coaching staff and the club's higher bodies





- Perform and interpret game analysis results
- Incorporate new technologies for the tactical study of the opponent
- Communicate assertively with players about decisions made
- Implement the most effective training methodologies in the current football landscape
- Improve the players' technique
- Apply different tactical solutions to the opponent's game systems
- Innovate in the work sessions, incorporating recreational football
- Working on injury prevention
- Learn key aspects of the neuromuscular system, motor control and its role in physical training
- Describe the different types of statistical analysis and their application in various situations for the understanding of phenomena that occur during training

- Correctly interpret all theoretical aspects defining strength and its components
- Incorporate elements of judgment of technical observation that make it possible to discriminate errors in the mechanics of the race and the procedures for their correction
- Apply stabilizing and mobilizing systems within the movement pattern
- Unpack and specify the basic concepts and objectives related to mobility training
- Correctly and safely administer the protocols of the different tests and the interpretation of the data collected
- Apply the concepts learned in an annual and/or multi-year planning design
- Apply the basic knowledge and technologies of biomechanics as a function of physical education, sport, performance and daily life
- Handle the nutritional aspects that are associated with eating disorders and sports injuries



You will develop competencies to lead high performance teams in the sports environment, including interpersonal skills, leadership and teamwork"





#### **International Guest Director**

Tyler Friedrich, Ph.D., is a leading personality in the international field of Sports Performance and Applied Sports Science. With a strong academic background, he has demonstrated an exceptional commitment to excellence and innovation, and has contributed to the success of numerous elite athletes internationally.

Throughout his career, Tyler Friedrich has deployed his expertise in a wide range of sporting disciplines, from football to swimming, volleyball to field hockey. His work in performance data analysis, especially through the Catapult athlete GPS system, and his integration of sports technology into performance programs, has established him as a leader in athletic performance optimization.

As Director of Sports Performance and Applied Sports Science, Dr. Friedrich has led strength and conditioning training, as well as the implementation of specific programs for several Olympic sports, including volleyball, rowing and gymnastics. Here, he has been responsible for integrating equipment services, sports performance in soccer and sports performance in Olympic sports. In addition, incorporating DAPER sports nutrition within an athlete performance team.

Also certified by USA Weightlifting and the National Strength and Conditioning Association, he is recognized for his ability to combine theoretical and practical knowledge in the development of high performance athletes. In this way, Dr. Tyler Friedrich has left an indelible mark on the world of Sports Performance, being an outstanding leader and driver of innovation in his field.



## Dr. Friedrich, Tyler

- Director of Sports Performance and Applied Sports Science at Stanford University
- Sports Performance Specialist
- Associate Director of Athletics and Applied Performance at Stanford University
- Director of Olympic Sport Performance at Stanford University
- Sports Performance Coach at Stanford University
- Ph.D. in Philosophy, Health and Human Performance from Concordia University Chicago
- Master of Science in Exercise Science from the University of Dayton
- Bachelor of Science, Exercise Physiology from the University of Dayton



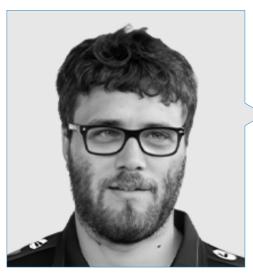
## tech 24 | Course Management

#### Management



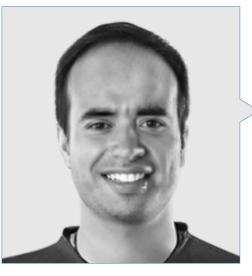
#### Dr. Rubina, Dardo

- Specialist in High Performance Sports
- CEO of Test and Training
- Physical Trainer at Moratalaz Sports School
- Teacher of Physical Education in Football and Anatomy. CENAFE Schools Carlet
- Coordinator of Physical Preparation in Field Hockey. Club Gimnasia y Esgrima de Buenos Aires
- Doctorate in High Performance Sports
- Postgraduate Certificate in Advanced Research Studies (DEA), University of Castilla la Mancha
- Master in High Performance Sports by the Autonomous University of Madric
- Postgraduate in Physical Activity in Populations with Pathologies by the University of Barcelona
- Competitive Bodybuilding Technician. Extremadura Federation of Bodybuilding and Fitness
- Expert in Sports Scouting and Quantification of Training Load (specialization in football), Sports Sciences. University of Melilla
- Expert in Advanced Weight Training by IFBB
- Expert in Advanced Nutrition by IFBB
- Specialist in Physiological Assessment and Interpretation of Physical Fitness by Bio
- Certification in Technologies for Weight Control and Physical Performance. Arizona State University



#### Mr. Fernández Fernández, Ángel

- Scout and responsible for the northern area for a Sportsmen Representation Agency (PHSport)
- Futsal and football coach
- Asturias area scout for Athlete Representation Agency (Vilasports)
- Sports Director of CD Mosconia
- Real Oviedo commentator at RadioGed
- Middle Level Sports Technician specializing in football at the Asturian Sport School Level 1 and 2



#### Mr. González Arganda, Sergio

- Physiotherapist of Atlético Madrid Football Club
- Lecturer in the Master's Degree in Physical Preparation and Sports Rehabilitation in Football at UNIR
- Teacher of Clinical Pilates University Expert at the University of Jaén
- Master's Degree in Biomechanics Applied to Injury Assessment from the Universidad Pontificia Comillas
- Master in Osteopathy of the Locomotor System by the Madrid School of Osteopathy
- Expert in Pilates Rehabilitation by the Royal Spanish Gymnastics Federation
- Master's Degree in Sports and Physical Activity Physiotherapy Comillas Pontifical University
- Diploma in Physiotherapy by Physiotraining

## tech 26 | Course Management

#### **Professors**

#### Mr. Añon, Pablo

- Physical trainer of the Women's National Volleyball Team for the Olympic Games
- Physical trainer of volleyball teams of the Argentinean Men's First Division
- Physical trainer of professional golfers Gustavo Rojas and Jorge Berent
- Swimming coach from Quilmes Athletic Club
- National Teacher of Physical Education (INEF) in Avellaneda
- Postgraduate degree in Sports Medicine and Applied Sports Sciences from the La Plata University
- Master in High Performance Sports by the Catholic University of Murcia
- Training courses oriented to the field of High Performance Sports

#### Mr. Carbone, Leandro

- Strength Training and Fitness Teacher
- CEO of LIFT, training and education company
- Head of the Department of Sports Evaluations and Exercise Physiology. WellMets Institute of Sports and Medicine in Chile
- CEO/ Manager at Complex I
- University Lecturer
- External Consultant for Speed4lift, a leading company in the area of sports technology
- Bachelor's Degree in Physical Activity from the Universidad del Salvador
- Specialist in Exercise Physiology, La Plata National University
- MCs. Strength and Conditioning en Greenwich University, United Kingdom

#### Mr. Masse, Juan Manuel

- Physical trainer for high performance athletes
- Director of the Athlon Science Study Group
- Physical trainer for several professional football teams in South America

#### Mr. Vaccarini, Adrián Ricardo

- Physical Trainer Specializing in First Level Football
- Head of the Applied Sciences Field of the Peruvian Football Federation
- Second Physical Trainer of the Peruvian Absolute Football Team
- Physical Trainer of the Peruvian National Under 23 National Team
- Responsible for the Research and Performance Analysis Area of Quilmes Atlético
- Responsible for the Research and Performance Analysis Area of Club Atlético Vélez Sarsfield
- Regular speaker at conferences from High Performance Sports
- Degree in Physical Education
- National Physical Education Teacher

#### Mr. Jareño Díaz, Juan

- Physical Preparation Specialist and Sport
- Coordinator of the education and physical preparation area at the Moratalaz Sports School
- University Lecturer
- Personal Trainer and Sports Coach at 9.8 Gravity Training Studio
- Graduate in Physical Activity and Sports Sciences from the University of Castilla la Mancha
- Master's Degree in University Law and Bioethics from the University of CastillaLa Mancha
- Postgraduate degree Therapeutic Personal from University of Castilla La Mancha



## Course Management | 27 tech

#### Dr. Del Rosso, Sebastián

- Expert researcher in Sports Biochemistry
- Postdoctoral researcher at the Clinical Biochemistry and Immunology Research Center
- Researcher in the Lifestyle and Oxidative Stress Research Group
- Co-author of numerous scientific publications
- Director of the Editorial Board of PubliCE Standard magazine
- Director of the Editorial Department of Grupo Sobre Entrenamiento
- Dr. in Health Sciences from the National University of Córdoba
- Degree in Physical Education from the National University Gral. San Martín
- Master's Degree in Physical Education from the Catholic University Gral. San Martín

#### Mr. César García, Gastón

- Expert Hockey and Rugby Fitness Trainer
- Physical Trainer of the professional field hockey player Sol Alias
- Carmen Tennis Club Hockey Team Physical Trainer
- Personal Trainer for Rugby and Hockey Athletes
- Physical Trainer for U18 Rugby Clubs
- Infant Physical Education Teacher
- Co-author of the book Strategies for evaluation of physical condition of children and teenagers
- Degree in Physical Education from the National University Gral. San Martín
- National Professor of Physical Education from ESEF San Rafael
- Anthropometry Technician Level 1 and 2

## tech 28 | Course Management

#### Dr. Represas Lobeto, Gustavo Daniel

- Physical trainer and researcher oriented to high performance sports
- Head of the Sports Biomechanics Laboratory of the National Center for High Performance Sports of Argentina
- Head of the Laboratory of Biomechanics, Functional Analysis of Movement and Human Performance of the San Martín National University
- Physical trainer and Scientific Advisor to the Olympic Taekwondo team for the Sydney Olympic Games
- Fitness trainer for professional rugby clubs and players
- Teacher in university studies
- D. in High Performance Sports from the University of Castilla-La Mancha
- Degree in Physical Education and Sports from the Interamerican Open University
- Master in High Performance Sports by the Autonomous University of Madrid
- National Physical Education Teacher

#### Ms. González Cano, Henar

- Sports Nutritionist
- Nutritionist and Anthropometrist at GYM SPARTA
- Nutritionist and Anthropometrist at Promentium Center
- Nutritionist in male football equipment
- Lecturer in courses related to Strength and Physical Conditioning
- Speaker at training events on Sports Nutrition
- Graduate in Human Nutrition and Dietetics from the University of Valladolid
- Master's Degree in Nutrition in Physical Activity and Sport by the Catholic University San Antonio in Murcia
- Course on Nutrition and Dietetics applied to physical exercise by the University of Vich

#### Mr Pantic, Milinko

- Football coach
- La Liga and Copa del Rey champion with Atlético de Madrid
- Former professional player of Atletico Madrid, Panionios, AC Le Havre

#### Mr Domínguez Allely, José Eutiminio

- Analyst at GiocaMeglio Company
- Goalkeeper trainer in basic and Reginal categories
- National Trainer
- 11-a-side Football and Indoor Football Instructor
- Sports technician Level

#### Mr. Magro Frías, Sergio

- Scouting PHsport Agency
- Physical trainer of UB Conquense, Manchego Ciudad Real, Real Ávila
- Superior Sports Technician in Football Level III
- Master's Degree in Physical Preparation and Football Readaptation by the Catholic University of Murcia
- Degree in Sports Science

#### Mr. Rodríguez Suárez, José

- Football Manager and Coach
- Football coach in various Real Oviedo and Real Oviedo Femenine base categories
- Physical Education Teacher in Primary Education
- Diploma in Teaching in the Specialty of Physical Education from the University of Oviedo
- Level III National Trainer Title
- Superior Technician in Sports Coaching

#### Mr. Di Giosia Alonso, Jonatan

- Coach of Racing Rioja
- Real Oviedo and FC Cartagena Scouting
- Trainer at Regional Sportsk in United Arab Emirates
- Coach of the Brazilian national team in the Integration World Cup Madrid
- Degree in Psychology from UNED
- Higher Grade football Coaching

#### Mr. Picó Acosta, Javier

- Sports Psychologist at E-Corp
- Sports Psychologist at Mental Gaming
- Psychologist and assistant trainer at Bahía de Mazarrón Basket
- Collaborator in sports psychology at Real Madrid
- Master's Degree in Coaching and Sports Psychology from the European University of Madrid
- Degree in Psychology
- Degree in Pedagogy

#### Ms. Fernández Lorenzo, Silvia

- Nutritionist and Dietician in Industrial Aviles
- Former Professional football Player
- Graduate in Human Nutrition and Dietetics from the European University Miguel de Cervantes
- Expert in Nutrition in Digestive Pathology by CEAN Group
- Member of the Association of Dietitians-Nutritionists of Spanish Football

#### Mr. Mahillo Atienza, Enrique

- Rayo Vallecano Physical Trainer and Recovery Coach
- Director of Personnel Training Las Rosas
- Degree in Physical Activity and Sports Sciences from Madrid Polytechnic University

#### Mr. Rodríguez Rodríguez, Alejandro

- Real Oviedo women's coach
- Teacher in Secondary Education
- Industrial Engineer at Urbaser
- CD Mosconia Coach
- Real Oviedo's youth coach
- Director of the chain of subsidiaries of U.D Pájara Playas de Jandía
- Coach of the U16 Asturian national football team
- Degree in Industrial Engineering
- Master's Degree in Occupational Risk Prevention
- Master's Degree in Teacher Training





## tech 32 | Structure and Content

#### Module 1. Exercise Physiology and Physical Activity

- 1.1. Thermodynamics and Bioenergetics
  - 1.1.1. Definition
  - 1.1.2. General Concepts
    - 1.1.2.1. Organic Chemistry
    - 1.1.2.2. Functional Groups
    - 1.1.2.3. Enzymes
    - 1.1.2.4. Coenzymes
    - 1.1.2.5. Acids and Bases
    - 1.1.2.6. PH
- 1.2. Energy Systems
  - 1.2.1. General Concepts
    - 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. Carbohydrate Metabolism
    - 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
  - 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 Cross-talk

- 1.3. Signaling Pathways
  - 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
  - 142 Fibers
  - 1.4.3. Innervation
  - 1.4.4. Muscle Cytoarchitecture
  - 1.4.5. Protein Synthesis and Breakdown
  - 1.4.6. mOR
- 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. Mecano Signal Transduction
  - 1.6.3. Metabolic Stress
  - 1.6.4. Muscle Damage and Inflammation
  - 1.6.5. Changes in Muscular Architecture
- 1.7. Fatique
  - 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. Central Governor Model

- 1.8. Maximum Oxygen Consumption
  - 1.8.1. Definition
  - 1.8.2. Assessment
  - 1.8.3. VO2 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. Biomechanics Applied to High Performance in Sports

- 2.1. Introduction to Biomechanics
  - 2.1.1. Biomechanics, Concept, Introduction and Purpose of Biomechanics
    - 2.1.1.1. Its Connection to Functional Anatomy
  - 2.1.2. Biomechanics and Performance
    - 2.1.2.1. Its Application to Physical Education and Sport
    - 2.1.2.2. Parts of Biomechanics, Generalities
    - 2.1.2.3. Measuring Tools
  - 2.1.3. Kinematics: Basic Concepts and Practical Applications
- 2.2. Movement in One Dimension
  - 2.2.1. Speed
    - 2.2.1.1. Concept of Speed
    - 2.2.1.2. Average speed
    - 2.2.1.3. Instant Speed
    - 2.2.1.4. Constant Speed
    - 2.2.1.5. Variable Speed
    - 2.2.1.6. Equations and Units
    - 2.2.1.7. Interpretation of Space-Time and Speed-Distance Graphs

- 2.2.1.8. Examples in Sport
- 2.2.2. Acceleration
  - 2.2.2.1. Concept of Acceleration
  - 2.2.2.2. Average Acceleration
  - 2.2.2.3. Instant Acceleration
  - 2.2.2.4. Constant Acceleration
  - 2.2.2.5. Variable Acceleration
  - 2.2.2.6. Connection With the Speed at Constant Acceleration
  - 2.2.2.7. Equations and Units
  - 2.2.2.8. Interpretation of Acceleration-Distance Graphs, Connection With

Speed-Time Graphs

- 2.2.2.9. Examples in Sport
- 2.2.3. Free Fall
  - 2.2.3.1. Acceleration of Gravity
  - 2.2.3.2. Ideal Conditions
  - 2.2.3.3. Variations of Gravity
  - 2.2.3.4. Equations
- 2.2.4. Graphical Surroundings
  - 2.2.4.1. Accelerations and Speeds in Free Fall
- 2.3. Movement in a Plane
  - 2.3.1. Speed
    - 2.3.1.1. Concept Through its Vectorial Components
    - 2.3.1.2. Interpreting Graphs Examples in Sport
  - 2.3.2. Acceleration
    - 2.3.2.1. Concept Through its Vectorial Components
    - 2.3.2.2. Interpreting Graphs
    - 2.3.2.3. Examples in Sport
  - 2.3.3. Projectile Movement
    - 2.3.3.1. Fundamental Components
    - 2.3.3.2. Initial Speed
    - 2.3.3.3. Initial Angle
    - 2.3.3.4. Ideal Conditions Initial Angle for Maximum Reach
    - 2.3.3.5. Equations Interpreting Graphs

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		2.3.3.6. Examples Applied to Jumps and Throws		2.5.7.	2.5.6.1. Types of Energy, Units and Conversion
2.4.		Kinematics of Rotations			Kinetic Energy
	2.4.1.	Angular Speed			2.5.7.1. Concept and Equations
		2.4.1.1. Angular Movement		2.5.8.	Potential Elastic Energy
		2.4.1.2. Average Angular Speed			2.5.8.1. Concept and Equations
		2.4.1.3. Instant Angular Speed			2.5.8.2. The Work and Energy Theorem
		2.4.1.4. Equations and Units			2.5.8.3. Interpretation from Examples in Sport
		2.4.1.5. Interpretation and Examples in Sport		2.5.9.	Amount of Movement and Collisions Interpretation
	2.4.2.	Angular Acceleration			2.5.9.1. Equations Center of Mass and Movement of the Center of Mass
		2.4.2.1. Average and Instantaneous Angular Acceleration			2.5.9.2. Collisions, Types, Equations and Graphs
		2.4.2.2. Equations and Units			2.5.9.3. Examples in Athletism
2.5.	Dynam	2.4.2.3. Interpretation and Examples in Sport Constant Angular Acceleration			2.5.9.4. Impulsive Forces Calculation of the Initial Speed in a Jump That is Considered as a Collision
	2.5.1.		2.6.	Dynam	ics of Rotations
		2.5.1.1. Interpretation		2.6.1.	Moment of Inertia
		2.5.1.2. Concept of Mass			2.6.1.1. Moment of a Force, Concept and Units
		2.5.1.3. Equations and Units			2.6.1.2. Lever Arm
		2.5.1.4. Examples in Sport		2.6.2.	Kinetic Energy of Rotation
	2.5.2.	Second Law of Newton			2.6.2.1. Moment of Inertia, Concept and Units
		2.5.2.1. Interpretation			2.6.2.2. Summary of Equations
		2.5.2.2. Concept of Weight and Deference to Mass			2.6.2.3. Interpretation. Examples in Sport
		2.5.2.3. Equations and Units Examples in Sport	2.7.	Statics	-Mechanical Balance
	2.5.3.	Third Law of Newton		2.7.1.	Vectorial Algebra
		2.5.3.1. Interpretation			2.7.1.1. Operations Between Vectors Using Graphical Methods
		2.5.3.2. Equations			2.7.1.2. Addition and Subtraction
		2.5.3.3. Centripetal and Centrifugal Force			2.7.1.3. Calculating Momentum
		2.5.3.4. Examples in Sport		2.7.2.	Center of Gravity: Concept, Properties, Interpretation of Equations
	2.5.4.	Work, Power and Energy			2.7.2.1. Examples in Sport Rigid Bodies Human Body Model
		2.5.4.1. Concept of Work	2.8.	Biome	chanical Analysis
		2.5.4.2. Equations, Units, Interpretation and Examples		2.8.1.	Analysis of Normal Gait and Running
	2.5.5.	Power			2.8.1.1. Center of Mass Phases and Fundamental Equations
		2.5.5.1. Equations, Units, Interpretation and Examples			2.8.1.2. Types of Kinematic and Dynamometric Records
	2.5.6.	Generalities on the Concept of Energy			2.8.1.3. Related Graphs

	2.8.2.	2.8.1.4. Connections of Graphs With Speed Jumps in Sport 2.8.2.1. Decomposing Movement 2.8.2.2. Center of Gravity 2.8.2.3. Phases 2.8.2.4. Distances and Component Heights
2.9.	Video A	nalysis
	2.9.1.	Different Variables Measured Through Video Analysis
	2.9.2.	Technological Options for Video Analysis
	2.9.3.	Practical Examples
2.10.	Case St	
		Biomechanical Analysis of Acceleration
		Biomechanical Analysis of Sprinting
	2.10.3.	Biomechanical Analysis of Deceleration
Mod	ule 3. P	Planning Applied to High Performance in Sports
3.1.	Basic F	undamentals
3.1.	Basic Fr 3.1.1.	undamentals Adaptation Criteria
3.1.		
3.1.		Adaptation Criteria
3.1.		Adaptation Criteria 3.1.1.1. General Adaptation Syndrome
3.1.	3.1.1.	Adaptation Criteria 3.1.1.1. General Adaptation Syndrome 3.1.1.2. Current Performance Capability, Training Requirement
3.1.	3.1.1. 3.1.2. 3.1.3.	Adaptation Criteria 3.1.1.1. General Adaptation Syndrome 3.1.1.2. Current Performance Capability, Training Requirement Fatigue, Performance, Conditioning as Tools
	3.1.1. 3.1.2. 3.1.3. Basic C	Adaptation Criteria 3.1.1.1. General Adaptation Syndrome 3.1.1.2. Current Performance Capability, Training Requirement Fatigue, Performance, Conditioning as Tools Dose-Response Concept and its Application
	3.1.1. 3.1.2. 3.1.3. Basic C 3.2.1.	Adaptation Criteria 3.1.1.1. General Adaptation Syndrome 3.1.1.2. Current Performance Capability, Training Requirement Fatigue, Performance, Conditioning as Tools Dose-Response Concept and its Application oncepts and Applications
	3.1.1. 3.1.2. 3.1.3. Basic C 3.2.1. 3.2.2.	Adaptation Criteria 3.1.1.1. General Adaptation Syndrome 3.1.1.2. Current Performance Capability, Training Requirement Fatigue, Performance, Conditioning as Tools Dose-Response Concept and its Application oncepts and Applications Concept and Application of the Plan
	3.1.1. 3.1.2. 3.1.3. Basic C 3.2.1. 3.2.2.	Adaptation Criteria 3.1.1.1. General Adaptation Syndrome 3.1.1.2. Current Performance Capability, Training Requirement Fatigue, Performance, Conditioning as Tools Dose-Response Concept and its Application oncepts and Applications Concept and Application of the Plan Concept and Application of Peridization
	3.1.1. 3.1.2. 3.1.3. Basic C 3.2.1. 3.2.2. 3.2.3. 3.2.4.	Adaptation Criteria 3.1.1.1. General Adaptation Syndrome 3.1.1.2. Current Performance Capability, Training Requirement Fatigue, Performance, Conditioning as Tools Dose-Response Concept and its Application oncepts and Applications Concept and Application of the Plan Concept and Application of Peridization Concept and Application of Programming
3.2.	3.1.1. 3.1.2. 3.1.3. Basic C 3.2.1. 3.2.2. 3.2.3. 3.2.4.	Adaptation Criteria 3.1.1.1. General Adaptation Syndrome 3.1.1.2. Current Performance Capability, Training Requirement Fatigue, Performance, Conditioning as Tools Dose-Response Concept and its Application oncepts and Applications Concept and Application of the Plan Concept and Application of Peridization Concept and Application of Programming Concept and Application of Load Control
3.2.	3.1.1.  3.1.2. 3.1.3.  Basic C 3.2.1. 3.2.2. 3.2.3. 3.2.4.  Concep 3.3.1.	Adaptation Criteria 3.1.1.1. General Adaptation Syndrome 3.1.1.2. Current Performance Capability, Training Requirement Fatigue, Performance, Conditioning as Tools Dose-Response Concept and its Application oncepts and Applications Concept and Application of the Plan Concept and Application of Peridization Concept and Application of Programming Concept and Application of Load Control tual Development of Planning and its Different Models
3.2.	3.1.1.  3.1.2. 3.1.3.  Basic C 3.2.1. 3.2.2. 3.2.3. 3.2.4.  Concep 3.3.1.	Adaptation Criteria 3.1.1.1. General Adaptation Syndrome 3.1.1.2. Current Performance Capability, Training Requirement Fatigue, Performance, Conditioning as Tools Dose-Response Concept and its Application oncepts and Applications Concept and Application of the Plan Concept and Application of Peridization Concept and Application of Programming Concept and Application of Load Control tual Development of Planning and its Different Models First Historical Planning Records

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#### 3.3.3.3. High Loads 3.4. Models Focused on Individuality and/or Load Concentration 3.4.1. Blocks 3.4.2. Integrated Macrocycle Integrated Model 3.4.3. ATR 3.4.4. 3.4.5. Keeping in Shape 3.4.6. By Objectives 3.4.7. Structural Bells Self-Regulation (APRE) 3.4.8. 3.5. Models Focused on Specificity and/or Movement Capacity 3.5.1. Cognitive (or Structured Microcycle) 3.5.2. Tactical Periodization Conditional Development by Movement Capacity Criteria for Correct Programming and Periodization 3.6.1. Criteria for Programming and Periodization in Strength Training Criteria for Programming and Periodization in Endurance Training 3.6.2. 3.6.3. Criteria for Programming and Periodization in Speed Training "Interference" Criteria in Scheduling and Periodization in Concurrent Training 3.7. Planning Through Load Control With a GNSS Device (GPS) 3.7.1. Basis of Session Saving for Appropriate Control 3.7.1.1. Calculation of the Average Group Session for a Correct Load Analysis 3.7.1.2. Common Errors in Saving and Their Impact on Plannning Relativization of the Load, a Function of Competence 3.7.3. Load Control by Volume or Density, Range and Limitations Integrating Thematic Unit 1 (Practical Application) 3.8.1. Construction of a Real Model of Short-Term Planning 3.8.1.1. Selecting and Applying the Periodization Model 3.8.1.2. Designing the Corresponding Planning Integrating Thematic Unit 2 (Practical Application)

3.9.1. Producing a Pluriannual Plannification

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#### 3.9.2. Producing an Annual Plannification

#### Module 4. Structure and operation of a football team

- 4.1. How a football club is organized
  - 4.1.1. What do we mean by football club?
  - 4.1.2. Hot football clubs are born?
  - 4.1.3. Types of clubs
  - 4.1.4. Most emblematic clubs
- 4.2. The president and the board of directors
  - 4.2.1. How it is formed
  - 4.2.2. Types of boards
  - 4.2.3. Positions and functions
  - 4.2.4. Members of a football club
- 4.3. Sports organization chart
  - 4.3.1. Members that make it up
  - 4.3.2. Is it separate from the rest of a club?
  - 4.3.3. Club sports ambassadors
  - 4.3.4. Other sports that make up the club
- 4.4. Sports Director
  - 4.4.1. What is a sports director?
  - 4.4.2. Functions
  - 4.4.3. Negotiations
  - 4.4.4. Dependents
- 4.5. Technical Secretary
  - 4.5.1. How is it different from the Sports Director?
  - 4.5.2. Who are its members?
  - 4.5.3. Their work
  - 4.5.4. The good harmony between the different departments
- 4.6. Base football coordinator
  - 4.6.1. What are you in charge of?
  - 4.6.2. Methodology in grassroots football

- 4.6.3. Dealing with players and their environment
- 4.6.4. Follow-up of players from outside the club
- 4.7. Press
  - 4.7.1. What is the press department and what is it for?
  - 4.7.2. Who makes up the press department
  - 4.7.3. The importance to the club
  - 4.7.4. Control over all club members
- 4.8. Security/Safety
  - 4.8.1. Security within a football club
  - 4.8.2. What is security in a club?
  - 4.8.3. Security measures in the enclosures
  - 4.8.4. Private security for club members
- 4.9. Toolmakers and gardeners
  - 4.9.1. What is a utilityman?
  - 4.9.2. What does a club's club steward do?
  - 4.9.3. The gardeners
  - 4.9.4. New technologies to maintain football fields
- 4.10. Other non-sports workers
  - 4.10.1. Administrators
  - 4.10.2. Official store personnel
  - 4.10.3. Stewardesses
  - 4.10.4. Workers on game day at the stadium

#### Module 5. Training methodology

- 5.1. The Training System
  - 5.1.1. Theoretical Foundation
  - 5.1.2. The game as a sum of structures
  - 5.1.3. Planning, Design and Execution
  - 5.1.4. Assessment and Control Training
- 5.2. Elements of the training system
  - 5.2.1. Fundamentals of collective play
  - 5.2.2. The player as the center of the process

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	5.2.3.	Methodological trends				
		The psychological aspect				
5.3.		ication of the different tasks				
	5.3.1.	How we classify the different tasks				
		Offensive tasks				
	5.3.3.	Defensive tasks				
		Mixed tasks				
5.4.						
		What are they for?				
		Types				
	5.4.3.	Actions without ball as protagonist				
		Actions with ball				
5.5.	Posses	ssion maintenance exercises				
	5.5.1.	What are they and what types are there?				
	5.5.2.	Possessions without structure				
	5.5.3.	Possessions with substructures				
	5.5.4.	Pressure games. Moment without ball				
5.6.	Conditional games					
	5.6.1.	Conditional games without completion				
	5.6.2.	Conditional games with completion				
	5.6.3.	Clashing macrostructures				
	5.6.4.	Games of position vs. Games of progression				
5.7.	Combined actions					
	5.7.1.	Types of evolutions Purpose				
	5.7.2.	Passing wheels Technical figures				
	5.7.3.	Technical figures with moment and substructure				
	5.7.4.	Collective automation				
5.8.	Playful	games				
	5.8.1.	What do we mean by recreational play in football?				
	5.8.2.	Maintenance				
	5.8.3.	Playful rounds				
	5.8.4.	Activities played				
5.9.	Parties					
	5.9.1.	Conditional matches				

5.9.2. Modified matches

5.9.3.	Conf	ronting	roles.	Simu	lations
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5.9.4. Reduced games

Mod	lule 6. S	Strength Training from Theory to Practice
6.1.	Strengt	th: Conceptualization
	6.1.1.	Strength Defined from a Mechanical Point of Vie
	6.1.2.	Strength Defined from a Physiology Point of View
	6.1.3.	Define the Concept of Applied Strength
	6.1.4.	Time-Strength Curve
		6.1.4.1. Interpretation
	6.1.5.	Define the Concept of Maximum Strength
	6.1.6.	Define the Concept of RFD
	6.1.7.	Define the Concept of Useful Strength
	6.1.8.	Strength- Speed-Power Curves
		6.1.8.1. Interpretation
	6.1.9.	Define the Concept of Strength Deficit
6.2.	Trainin	g Load
	6.2.1.	Define the Concept of Strength Training Load
	6.2.2.	Define the Concept of Load
	6.2.3.	Load Concept: Volume
		6.2.3.1. Definition and Applicability in Practice
	6.2.4.	Load Concept: Intensity
		6.2.4.1. Definition and Applicability in Practice
	6.2.5.	Load Concept: Density
		6.2.5.1. Definition and Applicability in Practice
	6.2.6.	Define the Concept of Effort Character

## 6.3. Strength Training in the Prevention and Rehabilitation of Injuries

6.2.6.1. Definition and Applicability in Practice

- 6.3.1. Conceptual and Operational Framework in Injury Prevention and Rehabilitation 6.3.1.1. Terminology. 6.3.1.2. Concepts
- 6.3.2. Strength Training and Injury Prevention and Rehabilitation Under Scientific Evidence
- 6.3.3. Methodological Process of Strength Training in Injury Prevention and Functional Recovery

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		6.3.3.1. Defining the Method
		6.3.3.2. Applying the Method in Practice
	6.3.4.	Role of Core Stability (Core) in Injury Prevention
		6.3.4.1. Definition of Core
		6.3.4.2. Core Training
6.4.	Plyome	etric Method
	6.4.1.	Physiological Mechanisms
		6.4.1.1. Specific General Information
	6.4.2.	Muscle Actions in Plyometric Exercises
	6.4.3.	The Stretch-Shortening Cycle (SSC)
		6.4.3.1. Use of Energy or Elastic Capacity
		6.4.3.2. Reflex Involvement Series and Parallel Elastic Energy Accumulation
	6.4.4.	CEA Classification Scheme
		6.4.4.1. Short CEA
		6.4.4.2. Long CEA
	6.4.5.	Properties of the Muscle and Tendon
	6.4.6.	Central Nervous System
		6.4.6.1. Recruitment
		6.4.6.2. Frequency (F)
		6.4.6.3. Synchronization
	6.4.7.	Practical Considerations
6.5.	Power	Training
	6.5.1.	Definition of Power
		6.5.1.1. Conceptual Aspects of Power
		6.5.1.2. The Importance of Power in a Context of Sport Performance
		6.5.1.3. Clarification of Power Terminology
	6.5.2.	Factors Contributing Peak Power Development
	6.5.3.	Structural Aspects Conditioning Power Production
		6.5.3.1. Muscle Hypertrophy
		6.5.3.2. Muscle Structure
		6.5.3.3. Ratio of Fast and Slow Fibers in a Cross Section
		6.5.3.4. Muscle Length and its Effect on Muscle Contraction
		6.5.3.5. Quantity and Characteristics of Elastic Components
	6.5.4.	Neural Aspects Conditioning Power Production

		6.5.4.1. Action Potential
		6.5.4.2. Speed of Motor Unit Recruitment
		6.5.4.3. Muscle Coordination
		6.5.4.4. Intermuscular Coordination
		6.5.4.5. Prior Muscle Status (PAP)
		6.5.4.6. Neuromuscular Reflex Mechanisms and Their Incidence
	6.5.5.	Theoretical Aspects for Understanding the Strength-Time Curve
		6.5.5.1. Strength Impulse
		6.5.5.2. Phases of the Strength-Time Curve
		6.5.5.3. Phases of Acceleration in the Strength-Time Curve
		6.5.5.4. Maximum Acceleration Area of the Strength-Time Curve
		6.5.5.5. Deceleration Phase of the Strength-Time Curve
	6.5.6.	Theoretical Aspects for Understanding Power Curves
		6.5.6.1. Energy-Time Curve
		6.5.6.2. Energy-Displacement Curve
		6.5.6.3. Optimal Workload for Maximum Energy Development
	6.5.7.	Practical Considerations
6.6.	Vector	Strength Training
	6.6.1.	Definition of Force Vector
		6.6.1.1. Axial Vector
		6.6.1.2. Horizontal Vector
		6.6.1.3. Rotational Vector
	6.6.2.	Benefits of Using this Terminology
	6.6.3.	Definition of Basic Vectors in Training
		6.6.3.1. Analysis of the Main Sporting Actions
		6.6.3.2. Analysis of the Main Overload Exercises
		6.6.3.3. Analysis of the Main Training Exercises
	6.6.4.	Practical Considerations
6.7.	Main N	Methods for Strength Training
	6.7.1.	Own Body Weight
	6.7.2.	Free Exercises
	6.7.3.	PAP
		6.7.3.1. Definition
		6.7.3.2. Application of the PAP prior to power-related sports disciplines

	6.7.4.	Exercises with Machines
	6.7.5.	Complex Training
	6.7.6.	Exercises and Their Transfer
	6.7.7.	Contrasts
	6.7.8.	Cluster Training
	6.7.9.	Practical Considerations
6.8.	VBT	
	6.8.1.	Conceptualization of the Application of VBT
		6.8.1.1. Degree of Stability of Execution Speed with Each Percentage of 1MR $$
	6.8.2.	Difference Between Scheduled Load and Actual Load
		6.8.2.1. Definition of the Concept
		6.8.2.2. Variables Involved in the Difference Between Programmed Load and Actual Training Load
	6.8.3.	VBT as a Solution to the Problem of Using 1MR and nMR to Program Loads
	6.8.4.	VBT and Degree of Fatigue
		6.8.4.1. Connection to Lactate
		6.8.4.2. Connection to Ammonium
	6.8.5.	VBT in Relation to the Loss of Speed and Percentage of Repetitions Performed
		6.8.5.1. Define the Different Degrees of Effort in the Same Series
		6.8.5.2. Different Adaptations According to the Degree of Speed Loss in the Series $$
	6.8.6.	Methodological Proposals According to Different Authors
	6.8.7.	Practical Considerations
6.9.	Strengt	h in Connection to Hypertrophy
	6.9.1.	Hypertrophy-Inducing Mechanism: Mechanical Stress
	6.9.2.	Hypertrophy-Inducing Mechanism: Metabolic Stress
	6.9.3.	Hypertrophy-Inducing Mechanism: Muscle Damage
	6.9.4.	Hypertrophy Programming Variables
		6.9.4.1. Frequency (F)
		6.9.4.2. Volume
		6.9.4.3. Intensity
		6.9.4.4. Cadence
		6.9.4.5. Series and Repetitions

		6.9.4.6. Density		
		6.9.4.7. Order in the Execution of Exercises		
	6.9.5.	Training Variables and Their Different Structural Effects		
		6.9.5.1. Effect on Different Types of Fiber		
		6.9.5.2. Effects on the Tendon		
		6.9.5.3. Bundle Length		
		6.9.5.4. Peneation Angle		
	6.9.6.	Practical Considerations		
6.10.	Eccentr	Eccentric Strength Training		
	6.10.1.	Conceptual framework		
		6.10.1.1. Definition of Eccentric Training		
		6.10.1.2. Different Types of Eccentric Training		
	6.10.2.	Eccentric Training and Performance		
	6.10.3.	Eccentric Training in the Prevention and Rehabilitation of Injuries		
	6.10.4.	Technology Applied to Eccentric Training		
		6.10.4.1. Conical Pulleys		
		6.10.4.2. Isoinertial Devices		
	6.10.5.	Practical Considerations		

## **Module 7.** Speed Training from Theory to Practice

7.1.	Speed	
	7.1.1.	Definition

7.1.2. General Concepts

7.1.2.1. Manifestations of Speed

7.1.2.2. Factors that Determine Performance

7.1.2.3. Difference Between Speed and Quickness

7.1.2.4. Segmental Speed

7.1.2.5. Angular Speed

7.1.2.6. Reaction Time

- 7.2. Dynamics and Mechanics of Linear Sprint (100m Model)
  - 7.2.1. Kinematic Analysis of the Take-off
  - 7.2.2. Dynamics and Strength Application During Take-off
  - 7.2.3. Kinematic Analysis of the Acceleration Phase
  - 7.2.4. Dynamics and Strength Application During Acceleration

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7.7.1.4. Jumpability

7.7.1.4.1. Building the Vertical Jump

	7.2.5.	Kinematic Analysis of Running at Maximum Speed				
	7.2.6.	Dynamics and Strength Application During Maximum Speed				
7.3.	Phases	s of Sprinting (Technique Analysis)				
	7.3.1.	Technical Description of the Take-off				
	7.3.2.	Technical Description of the Race During the Acceleration Phase				
		7.3.2.1. Technical Model of the Kinogram for the Acceleration Phase				
	7.3.3.	Technical Description of the Race During the Maximum Speed Phase				
		7.3.3.1. Technical Kinogram Model (ALTIS) for Technique Analysis				
	7.3.4.	Speed Endurance				
7.4.	Speed	Bioenergetics				
	7.4.1.	Bioenergetics of Single Sprints				
		7.4.1.1. Myoenergetics of Single Sprints				
		7.4.1.2. ATP-PC System				
		7.4.1.3. Glycolytic System				
		7.4.1.4. Adenylate Kinase Reaction				
	7.4.2.	Bioenergetics of Repeated Sprints				
		7.4.2.1. Energy Comparison Between Single and Repeated Sprints				
		7.4.2.2. Behavior of Energy Production Systems During Repeated Sprints				
		7.4.2.3. Recovery of PC				
		7.4.2.4. Connection Between Aerobic Power and Recovery Processes of CP				
		7.4.2.5. Determinants of Performance in Repeated Sprints				
7.5.	Analysi	Analysis of Acceleration Technique and Maximum Speed in Team Sports				
	7.5.1.	Description of the Technique in Team Sports				
	7.5.2.	Comparison of Sprinting Technique in Team Sports vs. Athletic Events				
	7.5.3.	Timing and Motion Analysis of Speed Events in Team Sports				
7.6.	Method	dological Approach to Teaching the Technique				
	7.6.1.	Technical Teaching of the Different Phases of the Race				
	7.6.2.	Common Errors and Ways to Correct Them				
7.7.	Means	and Methods for Speed Development				
	7.7.1.	Means and Methods for Acceleration Phase Training				
		7.7.1.1. Connection of Force to Acceleration				
		7.7.1.2. Sled				
		7.7.1.3. Slopes				

7.7.1.4.2. Building the Horizontal Jump 7.7.1.5. Training the ATP/PC System 7.7.2. Means and Methods for Training Top Speed 7.7.2.1. Plyometry 7.7.2.2. Overspeed 7.7.2.3. Interval-Intensive Methods 7.7.3. Means and Methods for Speed Endurance Development 7.7.3.1. Interval-Intensive Methods 7.7.3.2. Repetition Method 7.8. Agility and Change of Direction 7.8.1. Definition of Agility 7.8.2. Definition of Change of Direction 7.8.3. Determinants of Agility and COD 7.8.4. Change of Direction Technique 7.8.4.1. Shuffle 7.8.4.2. Crossover 7.8.4.3. Agility and COD training drills 7.9. Assessment and Control of Speed Training 7.9.1. Strength-Speed Profile 7.9.2. Test With Photocells and Variants With Other Control Devices 7.9.3. RSA 7.10. Programming Speed Training

#### **Module 8.** Endurance Training from Theory to Practice

8. I.	General	Concepts	

8.1.1. General Definitions

8.1.1.1. Education

8.1.1.2. Trainability

8.1.1.3. Sports Physical Preparation

8.1.2. Objectives Endurance Training

8.1.3. General Principles of Training

8.1.3.1. Principles of Load

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		8.1.3.3. Principles of Specialization			
8.2.	Physiology of Aerobic Training				
	8.2.1.	Physiological Response to Aerobic Endurance Training			
		8.2.1.1. Responses to Continuous Stress			
		8.2.1.2. Responses to Intervallic Stress			
		8.2.1.3. Responses to Intermittent Stress			
		8.2.1.4. Responses to Stress in Small-Space Games			
	8.2.2.	Factors Related to Aerobic Endurance Performance			
		8.2.2.1. Aerobic Power			
		8.2.2.2. Anaerobic Threshold			
		8.2.2.3. Maximum Aerobic Speed			
		8.2.2.4. Economy of Effort			
		8.2.2.5. Use of Substrates			
		8.2.2.6. Characteristics of Muscle Fibers			
	8.2.3.	Physiological Adaptations to Aerobic Endurance			
		8.2.3.1. Adaptations to Continuous Stress			
		8.2.3.2. Adaptations to Intervallic Stress			
		8.2.3.3. Adaptations to Intermittent Stress			
		8.2.3.4. Adaptations to Stress in Small-Space Games			
8.3.	Situatio	onal Sports and Their Relation to Aerobic Endurance			
	8.3.1.	Group I Situational Sport Demands; Football, Rugby and Hockey			
	8.3.2.	Group II Situational Sport Demands; Basketball, Handball, Futsal			
	8.3.3.	Group III Situational Sport Demands; Tennis and Volleyball			
8.4.	Monito	ring and Assessment of Aerobic Endurance			
	8.4.1.	Direct Treadmill Versus Field Evaluation			
		8.4.1.1. VO2max Treadmill Versus Field			
		8.4.1.2. VAM Treadmill Versus Field			
		8.4.1.3. VAM versus VFA			
		8.4.1.4. Time Limit (VAM)			
	8.4.2.	Continuous Indirect Tests			
		8.4.2.1. Time Limit (VFA)			

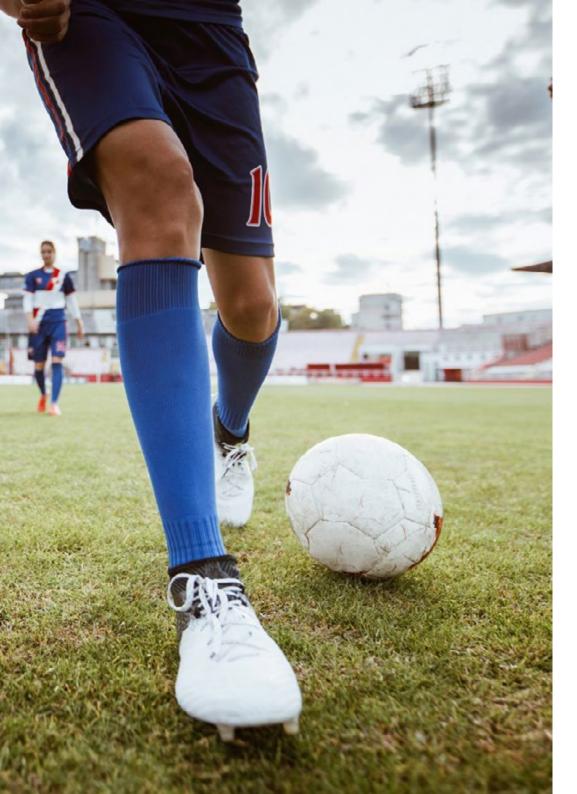
8.1.3.2. Principles of Organization

		8.4.2.2. 1,000m Test
		8.4.2.3. 5-Minute Test
	8.4.3.	Incremental and Maximum Indirect Tests
		8.4.3.1. UMTT, UMTT-Brue, VAMEVAL and T-Bordeaux
		8.4.3.2. UNCa Test; Hexagon, Track, Hare
	8.4.4.	Indirect Back-and-Forth and Intermittent Tests
		8.4.4.1. 20m. Shuttle Run Test (Navette Course)
		8.4.4.2. YoYo Test
		8.4.4.3. Intermittent Test; 30-15 IFT, Carminatti, 45-15 Test
	8.4.5.	Specific Tests With Ball
		8.4.5.1. Hoff Test
	8.4.6.	Proposal Based on the VFA
		8.4.6.1. VFA Contact Points for Football, Rugby and Hockey
		8.4.6.2. FSR Contact Points for Basketball, Futsal and Handball
8.5.	Plannir	ng Aerobic Exercise
	8.5.1.	Exercise Model
	8.5.2.	Training Frequency
	8.5.3.	Duration of the Exercise
	8.5.4.	Training Intensity
	8.5.5.	Density
8.6.	Method	ds to Develop Aerobic Endurance
	8.6.1.	Continuous Training
	8.6.2.	Interval Training
	8.6.3.	Intermittent Training
	8.6.4.	SSG Training (Small-Space Games)
	8.6.5.	Mixed Training (Circuits)
8.7.	_	m Design
	8.7.1.	Preseason Period
	8.7.2.	Competitive Period
	8.7.3.	Postseason Period
8.8.	Specia	l Aspects Related to Training
	8.8.1.	Concurrent Training
	8.8.2.	
	8.8.3.	Adaptations Generated by Concurrent Training

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		•			
		Differences Between Genders De-Training			
8.9.		c Training in Children and Youth			
0.9.	8.9.1.	General Concepts			
	0.9.1.	8.9.1.1. Growth, Development and Maturation			
	8.9.2.	Evaluation of VO2max and VAM			
	0.9.2.	8 9 2 1 Indirect Measurement			
		orale in manager mode and or more			
	0.0.0	8.9.2.2. Indirect Field Measurement			
	8.9.3.	Physiological Adaptations in Children and Youth			
		8.9.3.1. VO2máx and VAM Adaptations			
	8.9.4.	3			
		8.9.4.1. Intermittent Method			
		8.9.4.2. Adherence and Motivation			
		8.9.4.3. Games in Small Spaces			
Mod	dule 9. i	Mobility: from Theory to Performance			
9.1.	Neuror	nuscular System			
	9.1.1.	Neurophysiological Principles: Inhibition and Excitabilit			
		9.1.1.1. Adaptations of the Nervous System			
		9.1.1.2. Strategies to Modify Corticospinal Excitability			
		9.1.1.3. Keys to Neuromuscular Activation			
	9.1.2.	Somatosensory Information Systems			
		9.1.2.1. Information Subsystems			
		9.1.2.2. Types of Reflexes			
		9.1.2.2.1. Monosynaptic Reflexes			
		9.1.2.2.2. Polysynaptic Reflexes			
		9.1.2.2.3. Muscle-Tendinous-Articular Reflexes			
		9.1.2.3. Responses to Dynamic and Static Stretches			
9.2.	Motor Control and Movement				
	9.2.1.	Stabilizing and Mobilising Systems			
		9.2.1.1. Local System: Stabilizer System			
		9.2.1.2. Global System: Mobilizing System			
		9.2.1.3. Respiratory Pattern			
	9.2.2.	Movement Pattern			
		9.2.2.1 Co-Activation			





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- 9.2.2.2. Joint by Joint Theory
- 9.2.2.3. Primary Motion Complexes
- 9.3. Understanding Mobility
  - 9.3.1. Key Concepts and Beliefs in Mobility
    - 9.3.1.1. Manifestations of Mobility in Sport
    - 9.3.1.2. Neurophysiological and Biomechanical Factors Influencing Mobility Development
    - 9.3.1.3. Impact of Mobility on Strength Development
  - 9.3.2. Objectives of Training Mobility in Sport
    - 9.3.2.1. Mobility in the Training Session
    - 9.3.2.2. Benefits of Mobility Training
  - 9.3.3. Mobility and Stability by Structures
    - 9.3.3.1. Foot-Ankle Complex
    - 9.3.3.2. Knee-Hip Complex
    - 9.3.3.3. Spine-Shoulder Complex
- 9.4. Training Mobility
  - 9.4.1. Fundamental Block
    - 9.4.1.1. Strategies and Tools to Optimize Mobility
    - 9.4.1.2. Specific Pre-Exercise Scheme
    - 9.4.1.3. Specific Post-Exercise Scheme
  - 9.4.2. Mobility and Stability in Basic Movements
    - 9.4.2.1. Squat and Dead Lift
    - 9.4.2.2. Acceleration and Multidirection
- 9.5. Methods of Recovery
  - 9.5.1. Proposal for Effectiveness Based on Scientific Evidence
- 9.6. Methods for Training Mobility
  - 9.6.1. Tissue-Centered Methods: Passive Tension and Active Tension Stretching
  - 9.6.2. Methods Focused on Arthro-Coinematics: Isolated Stretching and Integrated Stretching
  - 9.6.3. Eccentric Training
- 9.7. Mobility Training Programming

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10.2. Second trainer

10.2.1. How to choose the second trainer?

10.2.2. Duties performed

	9.7.1.	Effects of Stretching in the Short and Long Term		10.2.3. The assistant coach is closer to the players		
	9.7.2.	Optimal Timing for Applying Stretching		10.2.4. Striking cases of second trainers		
9.8.	Athlete Assessment and Analysis			Goalkeeping coach		
	9.8.1.	Functional and Neuromuscular Assessment		10.3.1. The importance of a good goalkeeping coach		
		9.8.1.1. Key Concepts in Assessment		10.3.2. Its functions		
		9.8.1.2. Evaluation Process		10.3.3. Individual work with goalkeepers		
		9.8.1.2.1. Analyze the Movement Pattern		10.3.4. Other functions within the technical staff		
		9.8.1.2.2. Identify the Test	10.4.	Team delegate		
		9.8.1.2.3. Detect the Weak Links		10.4.1. What is a team delegate?		
	9.8.2.	Athlete Assessment Methodology		10.4.2. Differences with the field delegate		
		9.8.2.1. Types of Tests		10.4.3. Self-delegated or club delegate?		
		9.8.2.1.1. Analytical Assessment Test		10.4.4. Main Functions		
		9.8.2.1.2. General Assessment Test	10.5.	Physical trainer		
		9.8.2.1.3. Specific-Dynamic Assessment Test		10.5.1. What does the physical trainer do?		
		9.8.2.2. Assessment by Structures		10.5.2. No physicality, no football		
		9.8.2.2.1. Foot-Ankle Complex		10.5.3. The evolution in the method of working		
		9.8.2.2.2. Knee-Hip Complex		10.5.4. Types of physical trainers		
		9.8.2.2.3. Spine-Shoulder Complex	10.6	Analysts/scouts		
9.9.		y in Injured Athletes	10.0.	10.6.1. What is an analyst and what are his or her functions?		
	9.9.1.	Pathophysiology of Injury: Effects on Mobility		10.6.2. The Scout within a technical body		
		9.9.1.1. Muscle Structure		10.6.3. Differences between Analyst and Scout		
		9.9.1.2. Tendon Structure		10.6.4. Symbiosis between the two and the coaching staff		
		9.9.1.3. Ligament Structure	10.7	Medical staff		
	9.9.2.	Mobility and Preventiion of Injuries: Practical Case	10.7.	10.7.1. The importance of a club medical staff		
		9.9.2.1. Ruptured Ischialis in the Runner		10.7.2. Components of the medical staff		
Mod	lule 10.	Technical staff and coaching		10.7.3. Not everything can be discussed in the club		
		· · · · · · · · · · · · · · · · · · ·		10.7.4. Medical insurance for a football club		
10.1.	Trainer		10.0	for Psychologists		
		10.1.1. How to become a trainer		, ,		
		Types of coaches according to how they manage the team		10.8.1. What does a psychologist do in a football team?		
		The trainer as a cog in the whole technical staff		10.8.2. Working with players and staff		
	10.1.4.	What a coach does when he has no team				

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- 10.8.3. Working with other personnel
- 10.8.4. How to choose a psychologist
- 10.9. Coaching
  - 10.9.1. Introduction to Coaching
  - 10.9.2. Coaching individual
  - 10.9.3. Coaching teams
  - 10.9.4. Systemic Coaching
- 10.10. Group culture among staff members
  - 10.10.1. Methods of cohesion among members
  - 10.10.2. The idea of common play is important
  - 10.10.3. Fidelity as a fundamental part
  - 10.10.4. Is language an obstacle?

#### Module 11. Physical Preparation in Football

- 11.1. Physical Preparation and Sports Performance
  - 11.1.1. Physical preparation, physical fitness and sports training
  - 11.1.2. Differences between general physical preparation and specific physical preparation in football
  - 11.1.3. Basic physical capacities that are determinant in football
  - 11.1.4. Moments of the season when to work on the physical abilities that are decisive in football
- 11.2. Basic physical abilities in football Training methods
  - 11.2.1. Strength and its most important types in football
  - 11.2.2. Resistance and its most important types in football
  - 11.2.3. Speed and its most important types in football
  - 11.2.4. Flexibility in football
- 11.3. Annual sports planning in football
  - 11.3.1. Mesocycle, Macrocycle, Microcycle and Session
  - 11.3.2. The Preseason
  - 1133 The Season
  - 11.3.4. The competition week and its different types
- 11.4. The structure of a training session in relation to Physical Preparation
  - 11.4.1. The training session and its parts
  - 11.4.2. Heating and the different types of heating

- 11.4.3. The main part of the session
- 11.4.4. The final part of the session or return to calmness
- 11.5. Training methodologies for physical preparation in football
  - 11.5.1. Analytical physical preparation
  - 11.5.2. Integrated physical preparation
  - 11.5.3. The structured microcycle
  - 11.5.4. Tactical periodization
- 11.6. Strength training in the football player
  - 11.6.1. Importance of strength training in performance and injury prevention
  - 11.6.2. Types of strength training
  - 11.6.3. When using strength training
  - 11.6.4. Strength training planning in the microcycle
- 11.7. Methods of quantification of internal load and external load of training
  - 11.7.1. Internal and external training load
  - 11.7.2. How to quantify the internal load and external load of training
  - 11.7.3. The different types of load depending on the microcycle and the session
  - 11.7.4. Conclusions at the end of the training
- 11.8. Physical Preparation in extreme climatic environments
  - 11.8.1. Football player training at altitude
  - 11.8.2. Football training in desert climates
  - 11.8.3. Football training in cold climates
  - 11.8.4. Football training in humid climates
- 11.9. Non-competition periods
  - 11.9.1. Transitional period between seasons
  - 11.9.2. Non-competition period for national teams
  - 11.9.3. Periods of non-competition for long national competitions
  - 11.9.4. Periods of non-competition for health reasons
- 11.10. The use of GPS systems in the planning and development of training tasks
  - 11.10.1. What is a GPS system? How does it work and what parameters can be obtained?
  - 11.10.2. What variables are used to classify the different training tasks?
  - 11.10.3. How do we plan tasks and microcycles based on GPS variables?

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11.10.4. The individual player profile based on the game model and physical demands

#### Module 12. Technique in football

- 12.1. The technique Background
  - 12.1.1. General aspects of the technique
  - 12.1.2. Types of technique
  - 12.1.3. Evolution of the Technique
  - 12.1.4. Techniques/Tactics
- 12.2. Individual attack technique
  - 12.2.1. Dribble
  - 12.2.2. Shooting
  - 12.2.3. Conduction
  - 12.2.4. Control
- 12.3. Individual defense technique
  - 12.3.1. Tackle
  - 12.3.2. Clearance
  - 12.3.3. Weight
  - 12.3.4. Interception
- 12.4. Collective attack technique
  - 12.4.1. Pass
  - 12.4.2. Wall
  - 12.4.3. Change of orientation
  - 12.4.4. Blocking
- 12.5. Collective defense technique
  - 12.5.1. Aerial duels
  - 12.5.2. Timings
  - 12.5.3. Dummy pressure
  - 12.5.4. Defensive blocking
- 12.6. Technique in grassroots football
  - 12.6.1. PreBenjamín/ Benjamín
  - 12.6.2. The Novice
  - 12.6.3. The Underage

- 12.6.4. The Cadet
- 12.7. How do I bring the technique to the game model?
  - 12.7.1. Which players do I have?
  - 12.7.2. Technical-priority aspects
  - 12.7.3. Attack phase
  - 12.7.4. Defense phase
- 12.8. How do I plan training based on technique?
  - 12.8.1. Annual planning
  - 12.8.2. Planning during shutdowns
  - 12.8.3. Weekly planning
  - 12.8.4. Planning per session
- 12.9. How important is technique in high level performance?
  - 12.9.1. Concept of performance
  - 12.9.2. Objectives and characteristics
  - 12.9.3. Phases
  - 12.9.4. Development and implementation
- 12.10. The micro details for a professional football player
  - 12.10.1. Characteristics of the complete player
  - 12.10.2. Invisible Training
  - 12.10.3. Internal and external factors affecting the football player
  - 12.10.4. Individual talent at the service of the group

#### Module 13. Tactics in football

- 13.1. Are tactics and strategy the same thing? Theoretical Framework
  - 13.1.1. Definition of basic concepts
  - 13.1.2. Fundamental principles of the game
  - 13.1.3. Different tactical variants
  - 13.1.4. Differences and similarities
- 13.2. Offensive principles
  - 13.2.1. Definition
  - 13.2.2. Individual
  - 13.2.3. Collectives

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#### 13.3. Defensive principles

- 13.3.1. Definition
- 13.3.2. Individual
- 13.3.3. Collectives
- 13.3.4. Education

#### 13.4. Factors influencing the game

- 13.4.1. Anthropometric and motor
- 13.4.2. Psychological and psychosocial
- 13.4.3. Biological and Cognitive
- 13.4.4. Strategic and communicational

#### 13.5. Game systems

- 13.5.1. Characteristics and evolutions of each system
- 13.5.2. Advantages and disadvantages of each system
- 13.5.3. Defensive concepts and complements
- 13.5.4. Defensive concepts and complements

#### 13.6. Game situations

- 13.6.1. Offensive situations
- 13.6.2. Defensive situations
- 13.6.3. Attack-defense transition
- 13.6.4. Defense-attack transition

#### 13.7. Combat and neutralize tactical principles

- 13.7.1. Definition
- 13.7.2. Individual
- 13.7.3. Collectives
- 13.7.4. Education

#### 13.8. Game model

- 13.8.1. Game theory Trainer's hallmarks
- 13.8.2. Factors influencing the creation of the game model
- 13.8.3. Types of game models

- 13.8.4. Development and peculiarities of "MY" game model
- 13.9. Tactical periodization
  - 13.9.1. Methodological Principles
  - 13.9.2. Morphocycle pattern and subdynamics
  - 13.9.3. Morphocycle development over the course of a season
  - 13.9.4. Creation of tasks from Tactical Periodization
- 13.10. Strategy. Set pieces
  - 13.10.1. Offensive strategy
  - 13.10.2. Defensive strategy
  - 13.10.3. Training of set pieces
  - 13.10.4. Selection of actions according to the type of football player

#### Module 14. Analysis in football

- 14.1. Analysis of own equipment
  - 14.1.1. Microplane Analysis
  - 14.1.2. Functional Roles
  - 14.1.3. Meso Plane Analysis
  - 14.1.4. Macro Plane Analysis
- 14.2. Training analysis and coaching staff intervention
  - 14.2.1. Session Analysis
  - 14.2.2. Task Analysis
  - 14.2.3. Dynamic Interventions
  - 14.2.4. Static Interventions
- 14.3. Individual and collective analysis of the opposing team
  - 14.3.1. Determination of aspects to be observed
  - 14.3.2. Individual Reports
  - 14.3.3. Group and/or Team Reports
  - 14.3.4. Content Selection and Influence on the Game Plan
- 14.4. Influence of the opponent on the training tasks
  - 14.4.1. Introduction of Content in Training Tasks
  - 14.4.2. How do we coordinate the performance of the technical staff?
  - 14.4.3. How do we deal with the sub-phases of the game?

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14.10.3. Tagging structure

	14.4.4.	Training feedback			
14.5.	Transmi	ssion of the opponent's analysis to the player during the microcycle			
	14.5.1.	What content do we want to convey?			
		What type of microcycle or weekly structure am I in?			
	14.5.3.	How do I distribute the contents within the microcycle?			
	14.5.4.	Transmission Tools			
14.6.	Pre-match and in-game analysis				
	14.6.1.	Content Selection and Programming			
	14.6.2.	Transmission Tools			
	14.6.3.	Information Gathering and Exchange During the Match			
	14.6.4.	Analysis and Transmission of Information During the Break			
14.7.	Post-match analysis and final evaluation				
	14.7.1.	Analysis of your own and your opponent's behavior			
	14.7.2.	What, when and how do I transmit content?			
	14.7.3.	Continuous staff evaluation			
	14.7.4.	Continuous competition evaluation			
14.8.	Data analysis and metric analysis department				
	14.8.1.	Implementation of the Analysis Department			
	14.8.2.	The Alamar approach			
	14.8.3.	Database			
	14.8.4.	Data selection criteria			
14.9.	Audiovisual processes				
	14.9.1.	Concept of recording. What do we record?			
	14.9.2.	Use of recordsings. What is video?			
	14.9.3.	Plans			
	14.9.4.	Language of Communication			
14.10.	Tagging	and classification of events			
	14.10.1.	Concept			
	14.10.2.	Event Data. What data can we find?			

#### 14.10.4. Types of events based on game moments

#### Module 15. Football injuries

1	5.1.	Sports	ln	iuries

- 15.1.1. Injury concept vs. Sports Injury
- 15.1.2. When is a player injured?
- 15.1.3. Who decides that a player is injured?
- 15.1.4. Medical Discharge, Sports Discharge and Competitive Discharge
- 15.2. Types of injuries and their treatment
  - 15.2.1. Muscle injuries
  - 15.2.2. Ligament injuries
  - 15.2.3. Tendon injuries
  - 15.2.4. Joint and bone injuries
- 15.3. The medical staff and its objectives with an injured player
  - 15.3.1. The doctor
  - 15.3.2. Physiotherapists
  - 15.3.3. The sports trainer
  - 15.3.4. The physical trainer and coach
- 15.4. The most frequent injuries in football
  - 15.4.1. Injuries in the ischiosural area
  - 15.4.2. Sprains and the most affected areas
  - 15.4.3. Knee injuries and their types
  - 15.4.4. Quadriceps injuries
- 15.5. Why does a football player get injured? The most frequent causes
  - 15.5.1. Intrinsic factors of the football player
  - 15.5.2. Extrinsic factors of the football player
  - 15.5.3. Other factors:
  - 15.5.4. Incidence of injury
- 15.6. Recurrences of lesions and their possible causes
  - 15.6.1. What is a recurrence?
  - 15.6.2. Can a recurrence be avoided?
  - 15.6.3. What are the most frequent causes of recurrence?

- 15.6.4. How do we know if it's okay now?
- 15.7. Physical-sports rehabilitation and its phases of an injured football player
  - 15.7.1. Phases
  - 15.7.2. Functional Sports Recovery
  - 15.7.3. Functional Sports Recovery
  - 15.7.4. Sports Retraining
- 15.8. Stress retraining
  - 15.8.1. What is stress retraining?
  - 15.8.2. How do we control stress retraining?
  - 15.8.3. What parameters or tests do we take into account to assess the player's fitness?
  - 15.8.4. The player's feelings are important
- 15.9. Return to performance of an injured football player
  - 15.9.1. Aspects to be taken into account when reincorporating the player into the team
  - 15.9.2. First Steps
  - 15.9.3. Reincorporation into the group
  - 15.9.4. Example of planning for the return to competition
- 15.10. Injury prevention in a football player
  - 15.10.1. Prevention of the most common injuries
  - 15.10.2. The importance of strength in injury prevention
  - 15.10.3. When and how do we perform an injury prevention protocol?
  - 15.10.4. The player's work outside the team in injury prevention

#### Module 16. Sports Performance Assessment

- 16.1. Assessment
  - 16.1.1. Definitions: Test, Assessment, Measurement
  - 16.1.2. Validity, Reliability
  - 16.1.3. Purposes of the Evaluation
- 16.2. Types of Tests
  - 16.2.1. Laboratory Test
    - 16.2.1.1. Strengths and Limitations of Laboratory Tests
  - 16.2.2. Field Tests
    - 16.2.2.1. Strengths and Limitations of Field Tests
  - 16.2.3. Direct Tests
    - 16.2.3.1. Applications and Transfer to Training
  - 16.2.4. Indirect Tests

- 16.2.4.1. Practical Considerations and Transfer to Training
- 16.3. Assessment of Body Composition
  - 16.3.1. Bioimpedance
    - 16.3.1.1. Considerations in its Application to Field
    - 16.3.1.2. Limitations on the Validity of Its Data
  - 16.3.2. Anthropometry
    - 16.3.2.1. Tools for its Implementation
    - 16.3.2.2. Models of Analysis for Body Composition
  - 16.3.3. Body Mass Index (IMC)
    - 16.3.3.1. Restrictions on the Data Obtained for the Interpretation of Body Composition
- 16.4. Assessing Aerobic Fitness
  - 16.4.1. Vo2max Test on the Treadmill
    - 16.4.1.1. Astrand Test
    - 16.4.1.2. Balke Test
    - 16.4.1.3. ACSM Test
    - 16.4.1.4. Bruce Test
    - 16.4.1.5. Foster Test
    - 16.4.1.6. Pollack Test
  - 16.4.2. Cycloergometer VO2max Test
    - 16.4.2.1. Astrand. Ryhming
    - 16.4.2.2. Fox Test
  - 16.4.3. Cycloergometer Power Test
    - 16.4.3.1. Wingate Test
  - 16.4.4. Vo2max Test in he Field
    - 16.4.4.1. Leger Test
    - 16.4.4.2. Montreal University Test
    - 16.4.4.3. Mile Test
    - 16.4.4.4. 12-Minute Test
    - 16.4.4.5. 2.4Km Test
  - 16.4.5. Field Test to Establish Training Areas
    - 16.4.5.1. 30-15 IFT Test

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16.4.6. UNca Test 16.4.7 Yo-Yo Test 16.4.7.1. Yo-Yo Endurance YYET Level 1 and 2 16.4.7.2 Yo-Yo Intermittent Endurance YYEIT Level 1 and 2 16.4.7.3. Yo-Yo Intermittent Recovery YYERT Level 1 and 2 16.5. Neuromuscular Fitness Evaluation 16.5.1. Submaximal Repetition Test 16.5.1.1. Practical Applications for its Assessment 16.5.1.2. Validated Estimation Formulas for the Different Training Exercises 16.5.2. 1 RM Test 16.5.2.1. Protocol for its Performance 16.5.2.2. Limitations of 1 RM Assessment 16.5.3. Horizontal Jump Test 16.5.3.1. Assessment Protocols 16.5.4. Speed Test (5m,10m,15m, Etc.) 16.5.4.1. Considerations on the Data Obtained in Time/Distance Assessments 16.5.5. Maximum/Submaximum Incremental Progressive Tests 16.5.5.1. Validated Protocols 16.5.5.2. Practical Applications 16.5.6. Vertical Jump Test 16.5.6.1. SJ Jump 16.5.6.2. CMJ Jump 16.5.6.3. ABK Jump 16.5.6.4. DJ Test 16.5.6.5. Continuous Jump Test 16.5.7. Strength/Speed Vertical/Horizontal Profiles 16.5.7.1. Morin and Samozino Assessment Protocols 16.5.7.2. Practical Applications from a Strength/Speed Profile 16.6.9. Photoelectric Cells 16.5.8. Isometric Tests With Load Cell 16.5.8.1. Voluntary Isometric Maximal Strength Test (IMS) 16.5.8.2. Bilateral Deficit Isometry Test (%BLD) 16.5.8.3. Lateral Deficit (%LD)

16.5.8.4. Hamstring/Quadriceps Ratio Test 16.6. Assessment and Monitoring Tools 16.6.1. Heart Rate Monitors 16.6.1.1. Device Characteristics 16.6.1.2. Training Areas by Heart Rate 16.6.2. Lactate Analyzers 16.6.2.1. Device Types, Performance and Characteristics 16.6.2.2. Training Zones According to the Lactate Threshold Limit (LT) 16.6.3. Gas Analyzers 16.6.3.1. Laboratory vs Portable Laptops 16.6.4. GPS 16.6.4.1. GPS Types, Characteristics, Strengths and Limitations 16.6.4.2. Metrics Established to Interpret the External Load 16.6.5 Accelerometers 16.6.5.1. Types of Accelerometers and Characteristics 16.6.5.2. Practical Applications of Data Obtained From an Accelerometer 16.6.6. Position Transducers 16.6.6.1. Types of Transducers for Vertical and Horizontal Movements 16.6.6.2. Variables Measured and Estimated by of a Position Transducer 16.6.6.3. Data Obtained from a Position Transducer and its Applications to Training Programming 16.6.7. Strength Platforms 16.6.7.1. Types and Characteristics.of Strength Platforms 16.6.7.2. Variables Measured and Estimated by Means of a Strength Platform 16.6.7.3. Practical Approach to Training Programming 16.6.8. Load Cells 16.6.8.1. Cell Types, Characteristics and Performance 16.6.8.2. Uses and Applications for Sports Performance and Health

16.6.9.1. Characteristics, and Limitations of the Devices

16.6.9.2. Practical Uses and Applicability 16.6.10. Movile Applications

16.6.10.1. Description of the Most Used Apps on the Market: My Jump, PowerLift, Runmatic, Nordic

16.7. Internal and External Load

16.7.1. Objective Means of Assessment

16.7.1.1. Speed of Execution

16.7.1.2. Average Mechanical Power

16.7.1.3. GPS Device Metrics

16.7.2. Subjective Means of Assessment

16.7.2.1. PSE

16.7.2.2. sPSE

16.7.2.3. Chronic/Acute Load Ratio

16.8. Fatigue

16.8.1. General Concepts of Fatigue and Recovery

16.8.2. Assessments

16.8.2.1. Laboratory Objectives: CK, Urea, Cortisol, Etc. 16.8.2.2. Field Objectives: CMJ, Isometric Tests, etc. 16.8.2.3. Subjective: Wellness Scales, TQR, etc

16.8.3. Recovery Strategies: Cold-Water Immersion, Nutritional Strategies, Self-Massage, Sleep

16.9. Considerations for Practical Applications

16.9.1. Vertical Jump Test Practical Applications

16.9.2. Maximum/Submaximum Incremental Progressive Test Practical Applications

16.9.3. Vertical Strength-Speed Profile. Practical Applications

#### Module 17. Statistics Applied to Performance and Research

17.1. Notions of Probability

17.1.1. Simple Probability

17.1.2. Conditional Probability

17.1.3. Bayes' Theorem

17.2. Probability Distributions

17.2.1. Binomial Distribution

17.2.2. Poisson distribution

17.2.3. Normal Distribution

17.3. Statistical Inference

17.3.1. Population Parameters

17.3.2. Estimation of Population Parameters

17.3.3. Sampling Distributions Associated with the Normal Distribution

17.3.4. Distribution of the Sample Mean

17.3.5. Point Estimators

17.3.6. Properties of Estimators

17.3.7. Estimator Comparison Criteria

17.3.8. Estimators by Confidence Regions

17.3.9. Method of Obtaining Confidence Intervals

17.3.10. Confidence Intervals Associated With Normal Distribution

17.3.11. Central Limit Theorem

17.4. Hypothesis Test

17.4.1. P-Value

17.4.2. Statistical Power

17.5. Exploratory Analysis and Descriptive Statistics

17.5.1. Graphs and Tables

17.5.2. Chi-Square Test

17.5.3. Relative Risk

17.5.4. Odds Ratio

17.6. The T-Test

17.6.1. One-Sample T-Test

17.6.2. T-Test for Two Independent Samples

17.6.3. T-Test for Paired Samples

17.7. Correlation Analysis

17.8. Simple Linear Regression Analysis

17.8.1. The Regression Line and its Coefficients

17.8.2. Residuals

17.8.3. Regression Assessment Using Residuals

17.8.4. Coefficient of Determination

17.9. Variance and Analysis of Variance (ANOVA)

17.9.1. One-Way ANOVA

17.9.2. Two-Way ANOVA

17.9.3. ANOVA for Repeated Measures

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#### 17.9.4. Factorial ANOVA

#### Module 18. Psychology applied to football

- 18.1. Sport Psychology
  - 18.1.1. What is Psychology?
  - 18.1.2. Differences between "traditional" psychology and sport psychology
  - 18.1.3. Structure of psychological work
  - 18.1.4. Wants vs Needs
- 18.2. Psychological needs in football
  - 18.2.1. Main variables to be worked on
  - 18.2.2. Conflict mediation
  - 18.2.3. Multidisciplinary work in football
  - 18.2.4. Invisible Training
- 18.3. Team building
  - 18.3.1. Group vs Team
  - 18.3.2. Identity
  - 18.3.3. Structure
  - 18.3.4. Group Cohesion
- 18.4. Establishment of objectives and roles within a team
  - 18.4.1. SMART Objectives
  - 18.4.2. Group and Individual Objectives
  - 18.4.3. Who assigns roles within the team?
  - 18.4.4. Motivation and role
- 18.5. Attention and concentration in football
  - 18.5.1. What is Attention?
  - 18.5.2. What is Concentration?
  - 18.5.3. Activation Influence

- 18.5.4. Attentional focuses in football
- 18.6. Leadership
  - 18.6.1. What is it to be a leader?
  - 18.6.2. Types of Player Leadership
  - 18.6.3. Types of Leadership in coaches
  - 18.6.4. Transformational Leadership
- 18.7. Evaluation of a football team as a group
  - 18.7.1. Group Dynamics
  - 18.7.2. Sociogram
  - 18.7.3. Motorgram
  - 18.7.4. Data extraction and conclusions
- 18.8. Sports psychology in grassroots football
  - 18.8.1. Training or Competition?
  - 18.8.2. Parental training
  - 18.8.3. Work in values
  - 18.8.4. Role rotation
- 18.9. Sports psychology in high performance
  - 18.9.1. Worchel's cyclic model
  - 18.9.2. Player self-knowledge
  - 18.9.3. Working with the injured player
  - 18.9.4. Retirement in professional sports
- 18.10. Psychological work by the trainer
  - 18.10.1. Standards and rules
  - 18.10.2. Communication
  - 18.10.3. Individual treatment with players

#### 18.10.4. Working with the injured player

#### Module 19. Nutrition applied to football

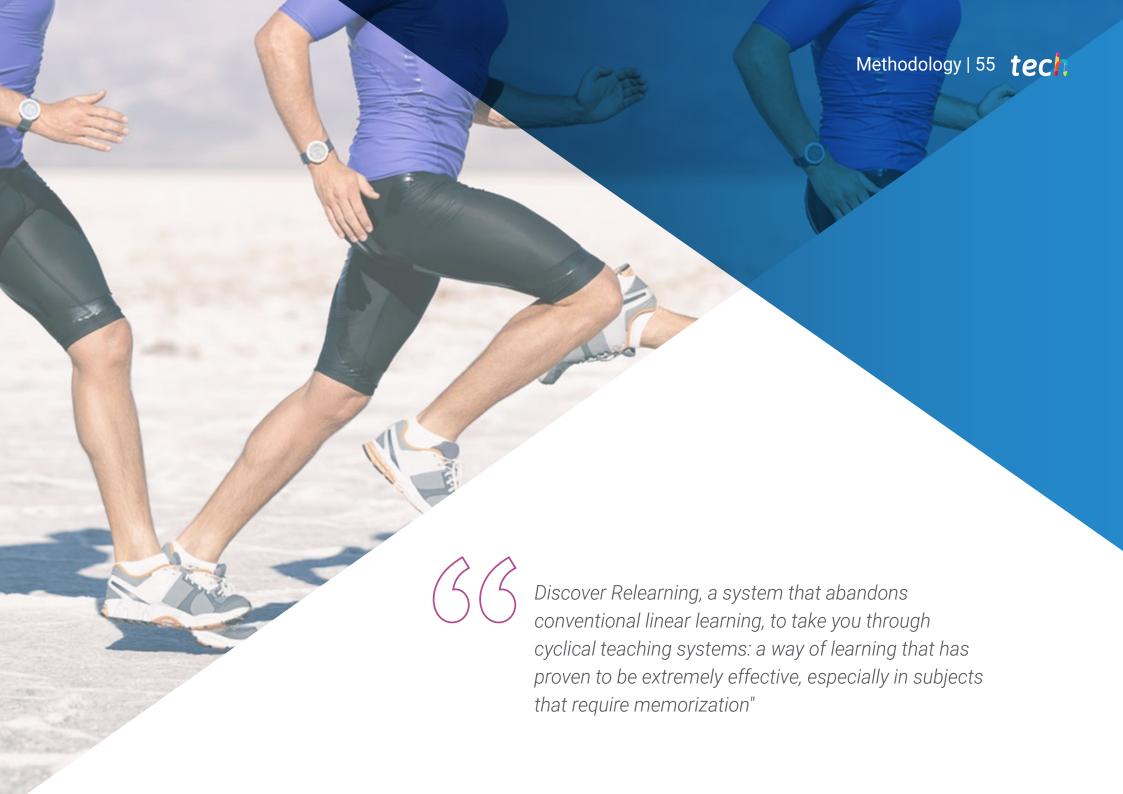
- 19.1. Energy requirements and body composition
  - 19.1.1. Energy Balance
  - 19.1.2. Energy expenditure in training and matches
  - 19.1.3. Body composition of the football player
  - 19.1.4. Body composition assessment
- 19.2. Macronutrients and micronutrients
  - 19.2.1. Carbohydrates
  - 19.2.2. Proteins
  - 19.2.3. Fats
  - 19.2.4. Vitamins and minerals
- 19.3. Hydration and fluid loss
  - 19.3.1. Water Balance
  - 19.3.2. Fluid intake and strategies
  - 19.3.3. Loss of liquid
  - 19.3.4. Hydration in training and matches
- 19.4. Nutrition in the competition period
  - 19.4.1. Daily nutrition of the football player
  - 19.4.2. Training demands
  - 19.4.3. Party demands
  - 19.4.4. Nutritional planning
- 19.5. Pre-match nutrition
  - 19.5.1. Macronutrients and fluids
  - 19.5.2. Pre-game meal
  - 19.5.3. Timing
  - 19.5.4. Ergogenic Aids
- 19.6. Post-match nutrition
  - 19.6.1. Macronutrients and fluids
  - 19.6.2. Post-game meal
  - 19.6.3. Timing

- 19.6.4. Ergogenic Aids
- 19.7. Nutrition in the injured player
  - 19.7.1. Important macronutrients and micronutrients
  - 19.7.2. Energy demands
  - 19.7.3. Supplementation and Ergogenic Aids
  - 19.7.4. Nutritional planning
- 19.8. Nutrition during the vacation period
  - 19.8.1. Macronutrient Distribution
  - 19.8.2. Micronutrients and ergogenic aids
  - 19.8.3. Energy demands
  - 19.8.4. Nutritional planning
- 19.9. Supplementation and Ergogenic Aids
  - 19.9.1. Classification and safety
  - 19.9.2. Sports foods and supplements
  - 19.9.3. Instant effect ergogenic aids
  - 19.9.4. Ergogenic aids with chronic effect
- 19.10. Special Situations
  - 19.10.1. Special situations
  - 19.10.2. Young players
  - 19.10.3. Football and heat
  - 19.10.4. Nutritional planning for travel



You will have access to practical and updated study material with real cases to improve the application of the concepts learned"





## tech 56 | Methodology

#### 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.



## Methodology | 59 tech

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.



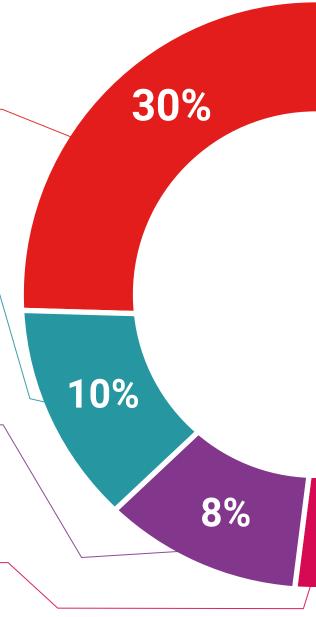
#### **Practising Skills and Abilities**

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.

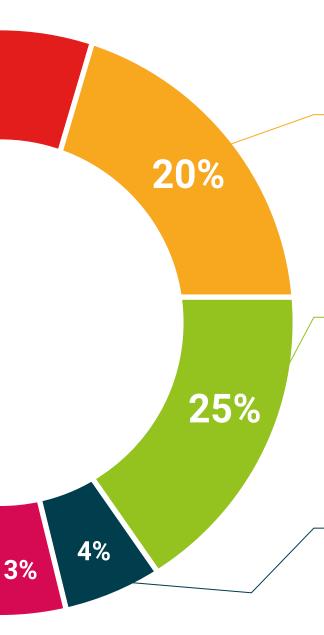


#### **Additional Reading**

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.



## Methodology | 61 tech



#### **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**

s' knowledge throughout the vivities and exercises, so that ey are achieving their goals

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.





## tech 64 | Certificate

This program will allow you to obtain your **Advanced Master's Degree diploma in High Performance and Competitive Football** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra (*official bulletin*). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

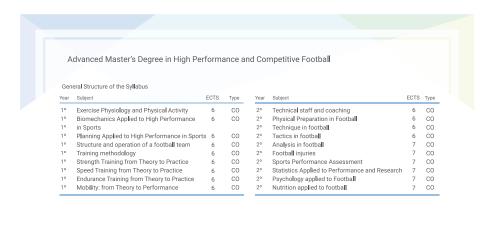
Title: Advanced Master's Degree in High Performance and Competitive Football

Modality: online

Duration: 2 years

Accreditation: 120 ECTS





<sup>\*</sup>Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.



# Advanced Master's Degree High Performance and Competition Football

- » Modality: online
- » Duration: 2 years
- » Certificate: TECH Global University
- » Credits: 120 ECTS
- » Schedule: at your own pace
- » Exams: online

