



# Master's Degree Professional Cycling

» Modality: Online

» Duration: 12 months.

» Certificate: TECH Global University

» Accreditation: 60 ECTS

» Schedule: at your own pace

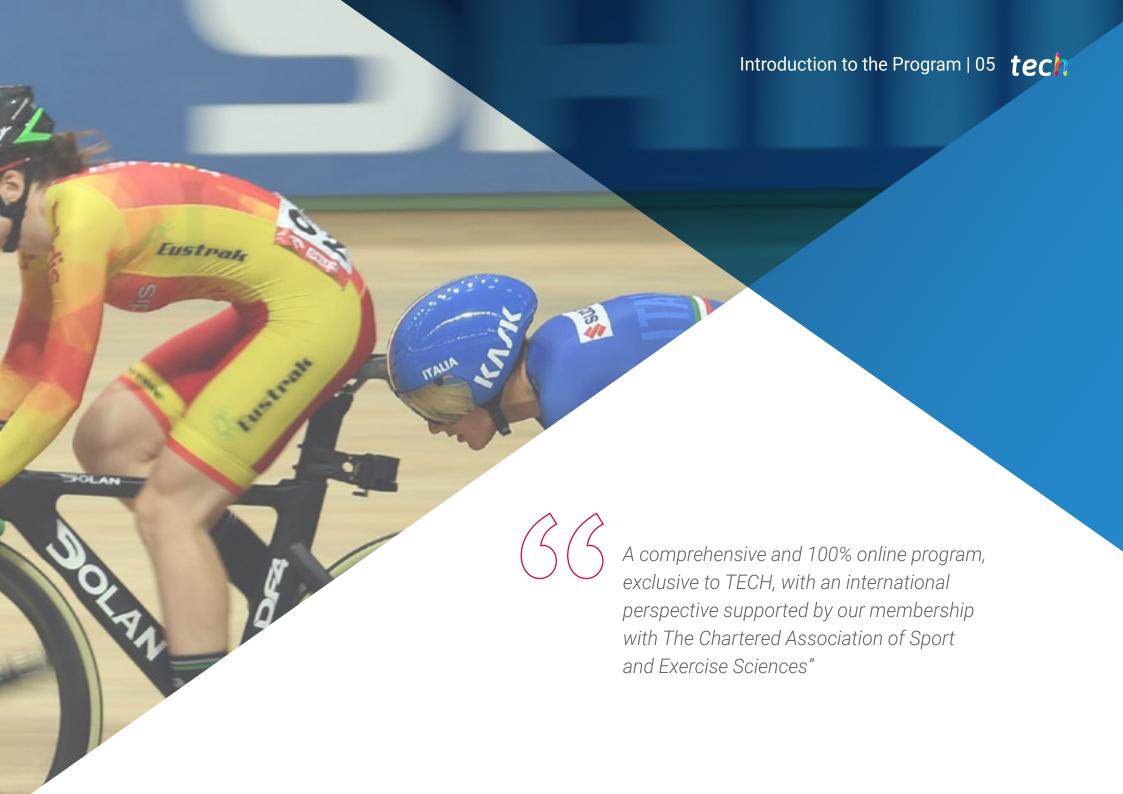
» Exams: online

Website: www.techtitute.com/us/sports-science/master-degree/master-professional-cycling

# Index

02 Introduction to the Program Why Study at TECH? p. 4 p. 8 05 03 Syllabus **Teaching Objectives Career Opportunities** p. 22 p. 12 p. 28 06 80 **Teaching Staff** Study Methodology Certificate p. 32 p. 42 p. 46





# tech 06 | Introduction to the Program

High performance in sports requires specialized knowledge and precise strategies to optimize athlete performance. In this context, Professional Cycling has established itself as a discipline that demands a combination of endurance, power, and rigorous planning. Beyond competition, its importance lies in the application of scientific principles to improve biomechanical efficiency, minimize the risk of injury, and maximize aerobic capacity. The integration of advanced technology and evidence-based methodologies allows cyclists to reach optimal performance.

Given this premise, TECH has created this Master's Degree in Professional Cycling, offering professionals a unique opportunity to strengthen their expertise in this field. With updated knowledge, they will be able to develop innovative training strategies, improve cyclists' energy efficiency, and design plans adapted to the demands of competition. Additionally, they will enhance critical analysis and the application of technological tools to assess performance in real-time.

Furthermore, dynamic and effective training will be ensured through the Relearning method, based on the progressive repetition of key content. Thanks to its 100% online format, access will be available at any time and from any device with internet connectivity. This flexible and adaptive approach will allow for practical knowledge absorption, promoting long-term retention and ensuring specialization aligned with the current demands of Professional Cycling.

Additionally, thanks to the membership in **The Chartered Association of Sport and Exercise Sciences (CASES)**, students will gain access to exclusive educational resources, discounts on events and specialized publications, and practical benefits such as professional insurance. They will also be able to join an active community, participate in committees, and obtain accreditations that enhance their development, visibility, and professional prospects in the field of sports and exercise science.

This **Master's Degree in Professional Cycling** contains the most complete and up-todate university program on the market. Its most notable features are:

- The development of practical cases presented by experts in Professional Cycling
- 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 the self-assessment process can be carried out to improve learning
- Special emphasis on innovative methodologies in high-performance sports
- 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



You will immerse yourself in highperformance sports environments, with a dynamic methodology and content available 24/7"

## Introduction to the Program | 07 tech



You will master the fundamental principles and advanced capabilities of exercise physiology in cyclists"

The teaching staff includes professionals from the field of Professional Cycling, who bring their practical experience into this program, alongside renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide 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.

With the innovative Relearning system, you will access key knowledge on muscular adaptation, understanding its processes and applications.

You will enhance training programming, applying innovative approaches to improve cyclist performance more effectively.







# tech 10 | Why Study at TECH?

#### The world's best online university, according to FORBES

The prestigious Forbes magazine, specialized in business and finance, has highlighted TECH as "the best online university in the world" This is what they have recently stated in an article in their digital edition in which they echo the success story of this institution, "thanks to the academic offer it provides, the selection of its teaching staff, and an innovative learning method oriented to form the professionals of the future".

#### The best top international faculty

TECH's faculty is made up of more than 6,000 professors of the highest international prestige. Professors, researchers and top executives of multinational companies, including Isaiah Covington, performance coach of the Boston Celtics; Magda Romanska, principal investigator at Harvard MetaLAB; Ignacio Wistumba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

#### The world's largest online university

TECH is the world's largest online university. We are the largest educational institution, with the best and widest digital educational catalog, one hundred percent online and covering most areas of knowledge. We offer the largest selection of our own degrees and accredited online undergraduate and postgraduate degrees. In total, more than 14,000 university programs, in ten different languages, making us the largest educational institution in the world.



The most complete syllabus





World's
No.1
The World's largest
online university

# The most complete syllabuses on the university scene

TECH offers the most complete syllabuses on the university scene, with programs that cover fundamental concepts and, at the same time, the main scientific advances in their specific scientific areas. In addition, these programs are continuously updated to guarantee students the academic vanguard and the most demanded professional skills. and the most in-demand professional competencies. In this way, the university's qualifications provide its graduates with a significant advantage to propel their careers to success.

#### A unique learning method

TECH is the first university to use Relearning in all its programs. This is the best online learning methodology, accredited with international teaching quality certifications, provided by prestigious educational agencies. In addition, this innovative academic model is complemented by the "Case Method", thereby configuring a unique online teaching strategy. Innovative teaching resources are also implemented, including detailed videos, infographics and interactive summaries.

#### The official online university of the NBA

TECH is the official online university of the NBA. Thanks to our agreement with the biggest league in basketball, we offer our students exclusive university programs, as well as a wide variety of educational resources focused on the business of the league and other areas of the sports industry. Each program is made up of a uniquely designed syllabus and features exceptional guest hosts: professionals with a distinguished sports background who will offer their expertise on the most relevant topics.

#### **Leaders in employability**

TECH has become the leading university in employability. Ninety-nine percent of its students obtain jobs in the academic field they have studied within one year of completing any of the university's programs. A similar number achieve immediate career enhancement. All this thanks to a study methodology that bases its effectiveness on the acquisition of practical skills, which are absolutely necessary for professional development.









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#### **Google Premier Partner**

The American technology giant has awarded TECH the Google Premier Partner badge. This award, which is only available to 3% of the world's companies, highlights the efficient, flexible and tailored experience that this university provides to students. The recognition not only accredits the maximum rigor, performance and investment in TECH's digital infrastructures, but also places this university as one of the world's leading technology companies.

#### The top-rated university by its students

Students have positioned TECH as the world's toprated university on the main review websites, with a highest rating of 4.9 out of 5, obtained from more than 1,000 reviews. These results consolidate TECH as the benchmark university institution at an international level, reflecting the excellence and positive impact of its educational model.





# tech 14 | Syllabus

## Module 1. Exercise Physiology in Cyclists

- 1.1. Energy Systems
  - 1.1.1. Phosphagen Metabolism
  - 1.1.2. Glycolysis
  - 1.1.3. Oxidative System
- 1.2. HR (Heart Rate)
  - 1.2.1. Resting Heart Rate
  - 1.2.2. Heart Rate Reserve
  - 1.2.3. Maximum Heart Rate
- 1.3. The Role of Lactate
  - 1.3.1. Definition
  - 1.3.2. Lactate Metabolism
  - 1.3.3. Role in Physical Activity and Threshold Determination
- 1.4. Determination of Ventilatory Thresholds (Physiological Milestones)
  - 1.4.1. VT1 (First Ventilatory Threshold)
  - 1.4.2. VT2 (First Ventilatory Threshold)
  - 1.4.3. Vo2max
- 1.5. Performance Markers
  - 1.5.1. FTP (Functional Threshold Power) / CP (Critical Power)
  - 1.5.2. VAM (Maximum Aerobic Speed)
  - 1.5.3. Compund Score
- 1.6. Performance Testing
  - 1.6.1. Laboratory Test
  - 1.6.2. Field Test
  - 1.6.3. Power Profile Test
- 1.7. HRV (Heart Rate Variability)
  - 1.7.1. Definition
  - 1.7.2. Measurement Methods
  - 1.7.3. HRV-Based Adaptations
- 1.8. Adaptations
  - 1.8.1. General Adaptations
  - 1.8.2. Central Adaptations
  - 1.8.3. Peripheral Adaptations

- 1.9. Blood Analysis
  - 1.9.1. Biochemistry
  - 1.9.2. Hematology
  - 1.9.3. Hormones
- 1.10. Female Physiology
  - 1.10.1. Unique Characteristics of Women
  - 1.10.2. Training and the Menstrual Cycle
  - 1.10.3. Specific Supplementation

### Module 2. Cycling Training Planning and Programming

- 2.1. Cycling Training Methods
  - 2.1.1. Continuous (Uniform and Variable)
  - 2.1.2. Interval Fractional Training
  - 2.1.3. Repetition Fractional Training
- 2.2. Distribution of Intensity
  - 2.2.1. Forms of Distribution
  - 2.2.2. Pyramidal
  - 2.2.3. Polarized
- 2.3. Block Periodization
  - 2.3.1. Traditional
  - 2.3.2. Block Periodization
  - 2.3.3. Inverse
- 2.4. Recovery Strategies
  - 2.4.1. Activate
  - 2.4.2. Passive
  - 2.4.3. Recovery Methods
- 2.5. Session Design
  - 2.5.1. Warm-Up
  - 2.5.2. Main Session
  - 2.5.3. Cool-Down

# Syllabus | 15 tech

- 2.6. Development of Capacities
  - 2.6.1. Improvement of VT1 (First Ventilatory Threshold)
  - 2.6.2. Improvement of VT2 (First Ventilatory Threshold)
  - 2.6.3. Improvement of Vo2max (First Ventilatory Threshold)
  - 2.6.4. Improvement of Pmax and Anaerobic Capacity
- 2.7. Long-Term Cyclist Development
  - 2.7.1. Learning to Train
  - 2.7.2. Learning to Compete
  - 2.7.3. Training to Compete
- 2.8. Master Cyclist Training
  - 2.8.1. Competitive Demands of Master Races
  - 2.8.2. Competitive Calendar
  - 2.8.3. Load Distribution
- 2.9. U23 Cyclist Training
  - 2.9.1. Competitive Demands
  - 2.9.2. Competitive Calendar
  - 2.9.3. Load Distribution
- 2.10. Professional Cyclist Training
  - 2.10.1. Competitive Demands
  - 2.10.2. Competitive Calendar
  - 2.10.3. Load Distribution

#### Module 3. Quantification of Loads

- 3.1. Traditional Quantification Model
  - 3.1.1. Definition of Quantification
  - 3.1.2. Three-Phase Model
  - 3.1.3. Advantages and Disadvantages
- 3.2. Banister Model
  - 3.2.1. Definition
  - 3.2.2. Why This Model?
  - 3.2.3. Second Banister Model

- 3.3. TRIMPs Model
  - 3.3.1. Definition
  - 3.3.2. Application Factors
  - 3.3.3. Advantages and Disadvantages
- 3.4. Lucia TRIMPs
  - 3.4.1. Definition
  - 3.4.2. Application Factors
  - 3.4.3. Advantages and Disadvantages
- 3.5. CTL, ATL and TSB
  - 3.5.1. Definition
  - 3.5.2. Application Factors
  - 3.5.3. Advantages and Disadvantages
- 3.6. ECOs Model
  - 3.6.1. Definition
  - 3.6.2. Application Factors
  - 3.6.3. Advantages and Disadvantages
- 3.7. Ouantification Based on sRPE
  - 3.7.1. Definition
  - 3.7.2. Application Factors
  - 3.7.3. Advantages and Disadvantages
- 3.8. Training Peaks
  - 3.8.1. Platform Explanation
  - 3.8.2. Characteristics and Functions
  - 3.8.3. Advantages and Disadvantages
- 3.9. Training Load Quantification in Professional Cycling
  - 3.9.1. Communication as a Daily Basis
  - 3.9.2. Ouantification Models
  - 3.9.3. Limitations
- 3.10. Doctoral Theses by Teun Van Erp and Daho Sanders
  - 3.10.1. Quantification in Professional Competitions
  - 3.10.2. Correlations Between Internal and External Load
  - 3.10.3. Limitations

# tech 16 | Syllabus

## Module 4. Power Cycling Training

- 4.1. What is Power?
  - 4.1.1. Definition
  - 4.1.2. What is a Watt (W)?
  - 4.1.3. What is a Joule?
- 4.2. Power Meters
  - 4.2.1. How the Power Meter Works
  - 4.2.2. Types
  - 4.2.3. Dual
  - 4.2.4. Pseudodual
- 4.3. What is FTP?
  - 4.3.1. Definition
  - 4.3.2. Estimation Methods
  - 4.3.3. Application to Training
- 4.4. Determination of strengths
  - 4.4.1. Competition Analysis
  - 4.4.2. Data Analysis
- 4.5 Power Profile
  - 4.5.1 Classic Power Profile
  - 4.5.2. Advanced Power Profile
  - 4.5.3. Power Profile Test
- 4.6. Performance Monitoring
  - 4.6.1 What is Performance?
  - 4.6.2. Monitoring of MMP (Maximum Mean Power)
  - 4.6.3. Monitoring Physiological Parameters
- 4.7. Power Management Chart (PMC)
  - 4.7.1. Monitoring External Load
  - 4.7.2. Monitoring Internal Load
  - 4.7.3. Integration of All Systems
- 4.8. Metrics
  - 4.8.1. CP (Critical Power)
  - 4.8.2. FRC/ w'
  - 4.8.3. Pmax
  - 4.8.4. Stamina / Durability

- 4.9. Fatigue Resistance
  - 4.9.1. Definition
  - 4.9.2. Based on KJ
  - 4.9.3. Based on KJ/kg
- 4.10. Pacing
  - 4.10.1. Definition
  - 4.10.2. Normative Values for Time Trials
  - 4.10.3. Estimation Software

#### Module 5. Biomechanics

- 5.1. What Is Biomechanics? What Goals Does it Pursue?
  - 5.1.1. Definition
  - 5.1.2. History
  - 5.1.3. Application for Performance and Injury Prevention
- 5.2. Methods for Biomechanics
  - 5.2.1. Static
  - 5.2.2. Dynamic
  - 5.2.3. Accelerometry
- 5.3. Foot, Arch, ROM, and Limb Length Discrepancy Assessment
  - 5.3.1. Plantar Arch (ALI)
  - 5.3.2. First Metatarsal
  - 5.3.3. Types of Feet
- 5.4. Functional Assessment
  - 5.4.1. ROM (Range of Motion)
  - 5.4.2. Limb Length Discrepancy
  - 5.4.3. Compensations
- 5.5. Shoe Selection and Bicycle Size (Stack and Reach)
  - 5.5.1. Types of Shoes
  - 5.5.2. Bicycle Frame Size Selection
  - 5.5.3. Differences Between Road, MTB, and Time Trial Bicycles
- 5.6. Goniometry (Optimal Angles)
  - 5.6.1. Saddle Height
  - 5.6.2. Setback
  - 5.6.3. Complementary Angles

- 5.7. Q-Factor and Cleat Adjustment
  - 5.7.1. Forward Movement
  - 5.7.2. Q-Factor
  - 5.7.3. Cleat Rotation
- 5.8. Torque
  - 5.8.1. Definition
  - 5.8.2. Application to Training
  - 5.8.3. Pedal Stroke Evaluation
- 5.9. Electromyography
  - 5.9.1. Definition
  - 5.9.2. Muscles Involved in Pedaling
  - 5.9.3. Pedal Stroke Evaluation with EMG Systems
- 5.10. Most Common Injuries
  - 5.10.1. Lower Back Injuries
  - 5.10.2. Knee Injuries
  - 5.10.3. Foot and Hand Injuries

#### Module 6. Cyclist Strength Training

- 6.1. Introduction to Strength
  - 6.1.1. Definition
  - 6.1.2. Concepts Related to Strength Expression
  - 6.1.3. Strength and Cycling
- 6.2. Benefits of Strength Training in Cyclists
  - 6.2.1. Molecular and Physiological Adaptation
  - 6.2.2. Neural Adaptations
  - 6.2.3. Improvement of Efficiency
  - 6.2.4. Improvement of Body Composition
- 6.3. Methods to Measure Strength
  - 6.3.1. Linear Measurement Systems
  - 6.3.2. Dynamometer
  - 6.3.3. Strength and Contact Platforms
  - 6.3.4. Optical Platforms and Apps

- 6.4. RM (One-Rep Max)
  - 6.4.1. Concept of RM
  - 6.4.2. Concept of NRM (Non-Rep Max)
  - 6.4.3. Concept of Effort Character
- 6.5. Execution Speed
  - 6.5.1. Characteristic of Execution Defined by Execution Speed
  - 6.5.2. Isoinertial Strength Evaluation
  - 6.5.3. Strength/Speed/Power Curve
- 6.6. Planning and Programming Strength Training
  - 6.6.1. Strength Programming
  - 6.6.2. Exercise Programming
  - 6.6.3. Session Programming
- 6.7. Strength Training on the Bicycle
  - 6.7.1. Start-ups
  - 6.7.2. Sprints
  - 6.7.3. Neuromuscular Work
  - 6.7.4. Is Torque Work Equal to Strength Training?
- 6.8. Concurrent Training
  - 6.8.1. Definition
  - 6.8.2. Strategies to Maximize Adaptations
  - 6.8.3. Advantages and Disadvantages
- 5.9. Recommended Exercises
  - 6.9.1. General
  - 6.9.2. Specific
  - 6.9.3. Session Example
- 6.10. Core Training
  - 6.10.1. Definition
  - 6.10.2. Benefits
  - 6.10.3. Mobility Exercises
  - 6.10.4. Types of Exercises

# tech 18 | Syllabus

## Module 7. Special Situations in Cycling Training

- 7.1. Heat
  - 7.1.1. Performance in Heat
  - 7.1.2. Training Responses and Adaptation Protocols
  - 7.1.3. Humid Heat vs Dry Heat
  - 7.1.4. Strategies to Enhance Benefits
- 7.2. Altitude
  - 7.2.1. Performance and Altitude
  - 7.2.2. Responders and Non-Responders
  - 7.2.3. Benefits of Altitude
- 7.3. Train High Live Low
  - 7.3.1. Definition
  - 7.3.2. Advantages
  - 7.3.3. Disadvantages
- 7.4. Live High Train Low
  - 7.4.1. Definition
  - 7.4.2. Advantages
  - 7.4.3. Disadvantages
- 7.5. Live High Compete High
  - 7.5.1. Definition
  - 7.5.2. Advantages
  - 7.5.3. Disadvantages
- 7.6. Hypoxia
  - 7.6.1. Definition
  - 7.6.2. Advantages
  - 7.6.3. Disadvantages
- 7.7. Intermittent Hypoxia
  - 7.7.1. Definition
  - 7.7.2. Advantages
  - 7.7.3. Disadvantages

- 7.8. Air Pollution
  - 7.8.1. Pollution and Performance
  - 7.8.2. Adaptation Strategies
  - 7.8.3. Disadvantages of Training
- 7.9. Jet Lag and Performance
  - 7.9.1. Jet Lag and Performance
  - 7.9.2. Adaptation Strategies
  - 7.9.3. Supplementation
- 7.10. Adaptability to Nutritional Changes
  - 7.10.1. Definition
  - 7.10.2. Performance Loss
  - 7.10.3. Supplementation

## Module 8. Nutrition in Cyclists

- 8.1. Concept of Sports Nutrition
  - 8.1.1. What is Sports Nutrition?
  - 8.1.2. Clinical Nutrition vs. Sports Nutrition
  - 8.1.3. Foods and Supplements
- 3.2. Basal Metabolic Rate (BMR) Calculation
  - 8.2.1. Components of Energy Expenditure
  - 8.2.2. Factors Affecting Resting Energy Expenditure
  - 8.2.3. Measuring Energy Consumption
- 8.3. Body Composition
  - 8.3.1. BMI and Traditional Ideal Weight. Does the "Ideal Weight" Exist?
  - 8.3.2. Subcutaneous Fat and Skinfold Thickness
  - 8.3.3. Other Methods for Determining Body Composition
- 8.4. Macronutrients and Micronutrients
  - 8.4.1. Definition of Macronutrients and Micronutrients
  - 8.4.2. Macronutrient Needs
  - 8.4.3. Micronutrient Needs

- 8.5. Macro and Micro Periodization
  - 8.5.1. Nutritional Periodization
  - 8.5.2. Periodization in Macrocycles
  - 8.5.3. Periodization in Microcycles
- 8.6. Sweat Rate and Hydration
  - 8.6.1. Measuring Sweat Rate
  - 8.6.2. Hydration Needs
  - 8.6.3. Electrolytes
- 8.7. Stomach and Digestive System Training
  - 8.7.1. Need to Train the Stomach and Digestive System
  - 8.7.2. Phases of the Stomach and Digestive System
  - 8.7.3. Application in Training and Racing
- 8.8. Supplementation
  - 8.8.1. Supplementation and Ergonutritional Aids
  - 8.8.2. The ABCD System of Supplements and Ergonutritional Aids
  - 8.8.3. Individual Supplementation Needs
- 8.9. Trends in Sports Nutrition
  - 8.9.1. Trends
  - 8.9.2. Low-Carb, High-Fat
  - 8.9.3. High-Carbohydrate Diets
- 8.10. Software and Applications
  - 8.10.1. Methods for Controlling Macronutrients
  - 8.10.2. Software for Nutrition Control
  - 8.10.3. Applications for Athletes

## Module 9. Structure and Functioning of a Cycling Team

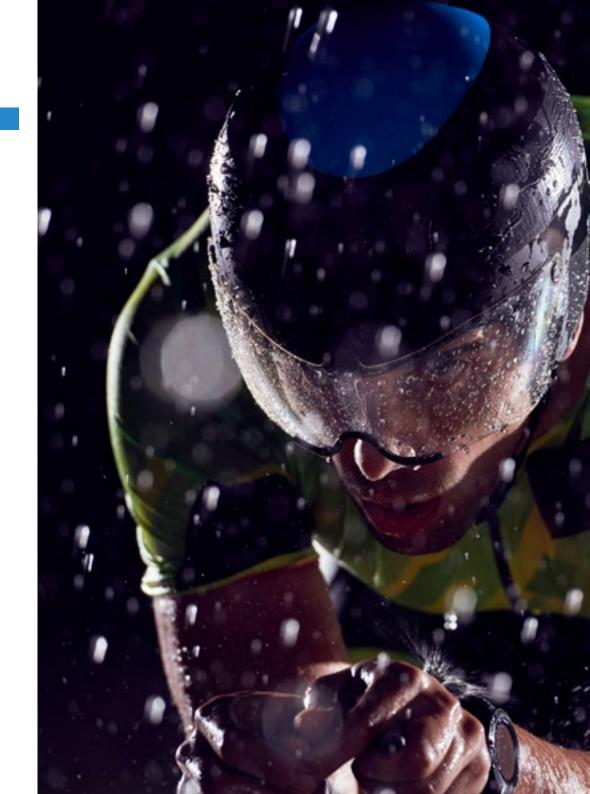
- 9.1. Categories of Teams
  - 9.1.1. Professional Categories (WT and ProContinental)
  - 9.1.2. Continental Category
  - 9.1.3. Elite and U23 Categories
- 9.2. Categories of Competitions
  - 9.2.1. Stage Races
  - 9.2.2. Classics
  - 9.2.3. Categories According to Participation Level

- 9.3. Lower Categories
  - 9.3.1. Schools
  - 9.3.2. Cadets
  - 9.3.3. Juniors
- 9.4. Role of the Manager
  - 9.4.1. Cycling Team Manager
  - 9.4.2. Sponsorships
  - 9.4.3. Cyclist Manager / Representative
- 9.5. Role of the Director
  - 9.5.1. Role of the Director as Coordinator
  - 9.5.2. Role of the Director as Organizer
  - 9.5.3. Role of the Director in Competition
- 9.6. Role of the Mechanics
  - 9.6.1. Professional Team Equipment
  - 9.6.2. Role of the Workshop Mechanic
  - 9.6.3. Role of the Race Mechanic
- 9.7. Role of the Assistants, Masseurs, and Physiotherapists
  - 9.7.1. Assistants
  - 9.7.2. Physiotherapists
  - 9.7.3. Masseurs
- 9.8. Role of the Rest of the Staff
  - 9.8.1. Office
  - 9.8.2. Workshop
  - 9.8.3. Press
- 9.9. How to Structure the Competition
  - 9.9.1. Competition Analysis
  - 9.9.2. Define Competition Goals
  - 9.9.3. Competition Planning Development
- 9.10. Day-to-Day Competition within a Team
  - 9.10.1. Pre-Competition
  - 9.10.2. During Competition
  - 9.10.3. Post-Competition

# tech 20 | Syllabus

## Module 10. Cycling Disciplines

- 10.1. Track Cycling
  - 10.1.1. Definition
  - 10.1.2. Track Events
  - 10.1.3. Competition Demands
- 10.2. Road Cycling
  - 10.2.1. Definition
  - 10.2.2. Modalities and Categories
  - 10.2.3. Competitive Demands
- 10.3. CX (Cyclocross)
  - 10.3.1. Definition
  - 10.3.2. Competition Demands
  - 10.3.3. Cyclocross Technique
- 10.4. Time Trial
  - 10.4.1. Definition
  - 10.4.2. Individual
  - 10.4.3. Teams
  - 10.4.4. Time Trial Preparation
- 10.5. MTB (Mountain Bike) / BTT (All-Terrain Bike)
  - 10.5.1. Definition
  - 10.5.2. MTB Events
  - 10.5.3. Competition Demands
- 10.6. Gravel
  - 10.6.1. Definition
  - 10.6.2. Competition Demands
  - 10.6.3. Specific Equipment
- 10.7. BMX
  - 10.7.1. Definition
  - 10.7.2. BMX Events
  - 10.7.3. BMX Demands







10.8. Adaptive Cycling

10.8.1. Definition

10.8.2. Eligibility Criteria

10.8.3. Competition Demands

10.9. New Modalities Regulated by the UCI

10.9.1. E-Bike

10.9.2. E-Sports

10.9.3. Artistic Cycling

10.10. Cyclotourism

10.10.1. Definition

10.10.2. Cyclotourism Demands

10.10.3. Strategies for Facing Events



You will expand your knowledge and stay at the forefront of the most advanced strategies for training in the different cycling disciplines"





# tech 24 | Teaching Objectives



# **General Objectives**

- Understand the physiology of exercise in cyclists and its impact on sports performance
- Develop skills to plan and program efficient, personalized cycling training
- Apply load quantification methods to optimize training and recovery
- Use power-based cycling training as a tool to enhance competitive performance
- Analyze and apply biomechanical principles to optimize cyclist posture and movement
- Implement specific strength training programs to improve endurance and power in cyclists
- Manage special training situations, adapting strategies to different contexts and conditions
- Design appropriate nutritional plans for cyclists, maximizing their performance and recovery



You will Identify various categories of cycling teams, from professional to elite levels"







## **Specific Objectives**

## Module 1. Exercise Physiology in Cyclists

- Analyze the energy systems of cyclists to optimize performance at different exercise intensities
- Evaluate heart rate in its different modalities to adjust training and improve performance
- Determine ventilatory thresholds and their relationship with performance to personalize cyclist training
- Determine ventilatory thresholds and their relationship with performance to personalize cyclist training

#### Module 2. Cycling Training Planning and Programming

- Apply cycling training methods, such as continuous and interval training, to enhance performance
- Distribute training intensity using pyramid and polarized approaches
- Plan cycling training periodization according to different models, tailored to each phase
- Implement active and passive recovery strategies to optimize physical adaptation

#### Module 3. Quantification of Loads

- Apply different load quantification models, such as the traditional and Banister models, to optimize cycling training planning
- Use advanced tools like TRIMPs and Lucia TRIMPs models to evaluate work load and adjust training based on their advantages and limitations
- Utilize the Training Peaks platform for load quantification and tracking, improving the precision of real-time analyses
- Analyze and apply the ECOs and sRPE quantification model, evaluating their advantages and disadvantages in professional cycling training



#### Module 4. Power Cycling Training

- Understand the concepts of power, watts, and joules, and their application in cycling training to enhance performance
- Select and use appropriate power meters, understanding their operation and types (dual and pseudodual) to obtain precise measurements
- Evaluate FTP (Functional Threshold Power) using different estimation methods and apply this measure to optimize training
- Analyze cyclist performance using the Power Management Chart (PMC), integrating external and internal load to adjust training and prevent fatigue

#### Module 5. Biomechanics

- Understand the basic concepts of biomechanics, its history, and its application to improving performance and preventing injuries
- Apply different biomechanical methods (static, dynamic, accelerometry) to assess cyclist performance and prevent injuries
- Conduct a functional assessment, including range of motion (ROM) measurement and identifying limb length discrepancies to optimize pedaling technique
- Properly select shoes and adjust the bike size (Stack and Reach) to improve ergonomics and prevent injuries

### Module 6. Cyclist Strength Training

- Understand the importance of strength in cycling, including its definition and impact on performance
- Identify the benefits of strength training, such as molecular, physiological, and neural adaptations that improve efficiency and body composition
- Use various methods to measure strength, from linear systems to optical platforms and mobile applications
- Apply key concepts like RM (Repetition Maximum) and NRM (No Repetition Maximum) in strength training programming and evaluation

#### Module 7. Special Situations in Cycling Training

- Evaluate physiological responses to heat and how to optimize performance under different thermal conditions
- Examine the effects of altitude on cycling performance, highlighting the variability between "responders" and "non-responders"
- Determine the advantages and disadvantages of "Train High-Live Low" and "Live High-Train Low" protocols in performance enhancement
- Analyze the effects of intermittent hypoxia on physical adaptation and the possible limitations for high-performance cyclists

### Module 8. Nutrition in Cyclists

- Evaluate the energy needs and factors affecting energy expenditure at rest in cyclists
- Determine cyclists' body composition through methods such as BMI, subcutaneous fat, and skinfold thickness
- Analyze macronutrient and micronutrient needs specific to optimize performance in highlevel cycling
- Apply nutritional periodization strategies in macrocycles and microcycles to enhance recovery and maximize performance

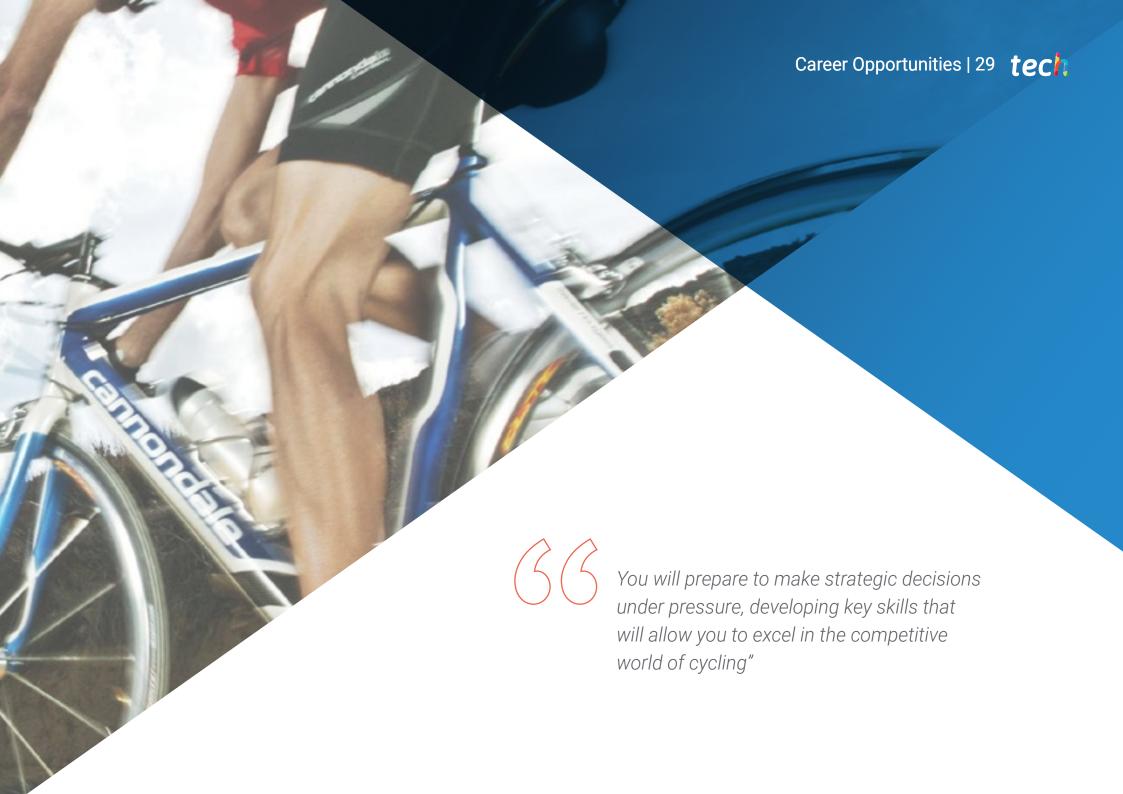
#### Module 9. Structure and Functioning of a Cycling Team

- Identify the different cycling team categories, including professional (WT and ProContinental), continental, elite, and U23 categories
- Analyze the various categories of competitions, such as stage races, classics, and according to participation levels, to optimize team strategy
- Develop a work plan for structuring and coordinating a cycling team during competition, considering the roles of the manager, director, and mechanics
- Create a plan for day-to-day competition, covering pre-competition to post-competition, to ensure the team's best performance

### Module 10. Cycling Disciplines

- Define the characteristics and demands of competitions in track cycling, including specific events and their physical requirements
- Analyze the competitive demands in road cycling, with particular focus on modalities and categories in these competitions
- Develop strategies and techniques necessary to compete in Cyclocross (CX), considering the specific demands of the competition
- Explore the particularities of time trials, both individually and by teams, and how to prepare effectively for this discipline





# tech 30 | Career Opportunities

#### **Graduate Profile**

The graduate will be qualified to lead high-performance teams, manage international competitions, and optimize resources in sports events. They will also have a strategic and analytical vision to anticipate needs and make decisions that drive success. Furthermore, they will master the latest trends in technology applied to cycling, as well as the legal and logistical aspects involved in event management. Ultimately, they will stand out for their adaptability and innovative approach, positioning themselves as a leader in the Professional Cycling and sports management sector.

You will contribute to the development and improvement of sports performance by applying the latest trends in technology, adjusting each strategy to the specific needs of athletes.

- Strategic Team Management: Lead high-performance teams, making key decisions under pressure and maintaining cohesion among members to achieve goals in high-level competitions.
- Performance Data Analysis: Interpret training and competition data using advanced technological tools to optimize cyclists' performance and improve their physical output.
- **Competition Planning and Logistics:** Coordinate and manage logistics for competitions, ensuring that all details, from transportation to race strategy, are perfectly organized.
- Adaptation to Change and Problem-Solving: Adapt to unforeseen situations during competitions or training, making quick and effective decisions to maximize team performance in the face of unexpected challenges.



After completing the university program, you will be able to apply your knowledge and skills in the following positions:

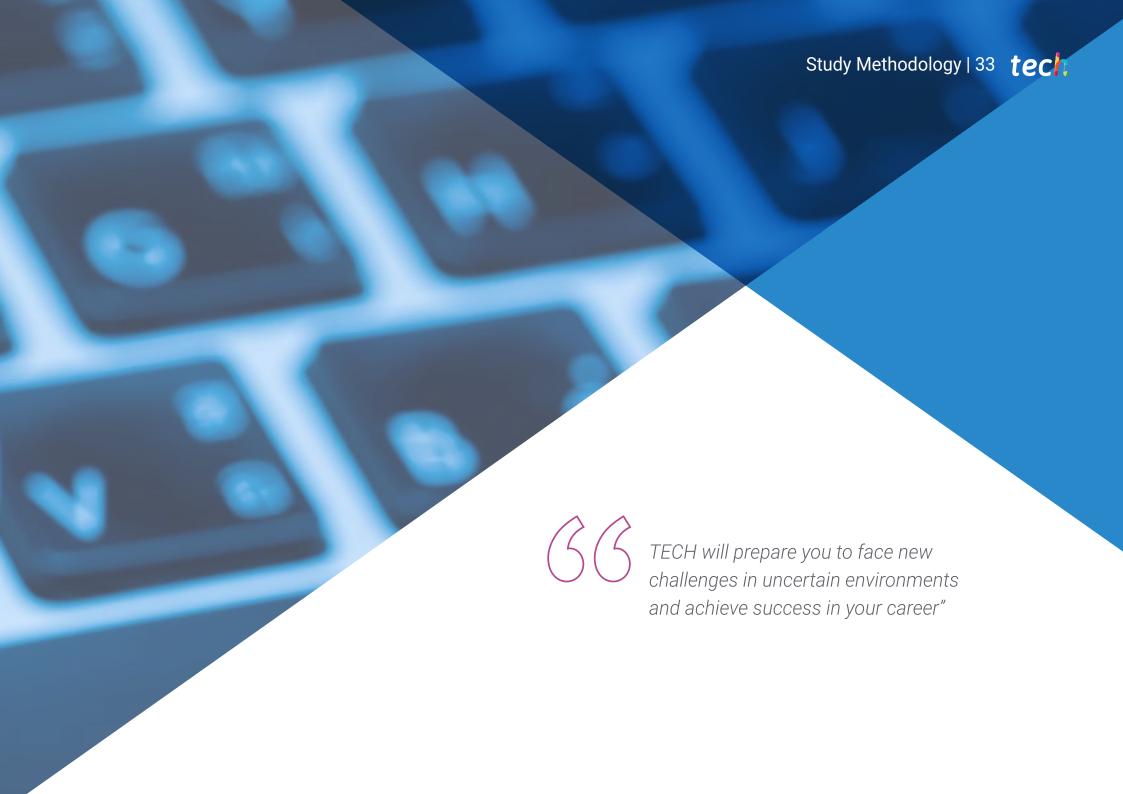
- **1.Cycling Team Director:** Responsible for coordinating all team activities, including strategic planning, managing human and material resources, and making key decisions during competitions.
- **2. Team Manager:** Oversees the team's daily logistics, manages relationships with sponsors and organizers, and ensures all operational aspects are covered throughout the season.
- **3. Sports Director:** Responsible for planning and executing sports strategies, coordinating training, preparation, and performance of cyclists in various competitions.
- **4. Race Mechanic:** Maintains and repairs the team's bikes during competitions, ensuring all cyclists have their bikes in optimal condition.
- **5. Workshop Mechanic:** Handles bike maintenance and repairs during training and before competitions, as well as managing spare parts and tool inventory.
- **6. Sports Physiotherapist:** Manages the recovery of cyclists, preventing injuries and optimizing their performance through rehabilitation techniques, stretching, and massage.
- **7. Performance Analyst:** Oversees the use of technological tools to analyze cyclists' data, evaluating performance across different stages and conditions, providing detailed reports to optimize training and strategies.
- **8. Communications Manager:** Manages the team's public image, maintains contact with the media, organizes press conferences, and ensures communications are coherent and effective.

- 9. Team Logistics Coordinator: Handles daily logistics, managing transportation, accommodation, and team needs during competitions, ensuring everything is in place for optimal cyclist performance.
- 10. Personal Trainer: Designs customized training programs for each cyclist, based on their individual needs, aiming to improve performance, prevent injuries, and achieve competition goals.



You will stand out as a cycling team director, leading with strategy and optimizing performance in highlevel competitions"



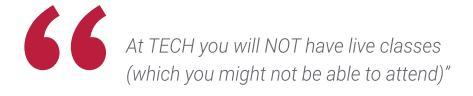


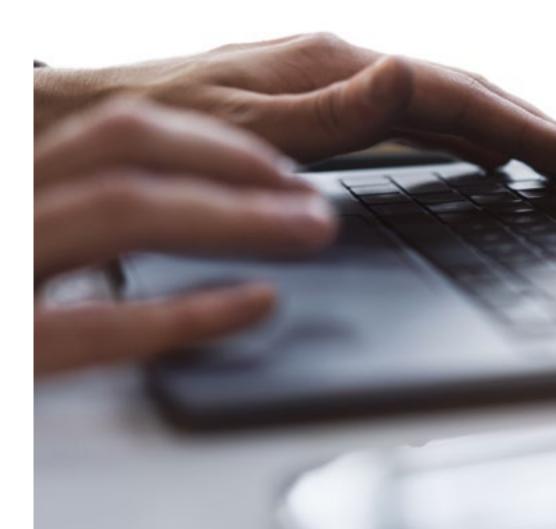
## The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.

The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.







## The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.



TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want"

# tech 36 | Study Methodology

#### Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



# Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

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





# A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

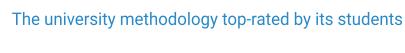
Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.



The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule"

### The effectiveness of the method is justified by four fundamental achievements:

- 1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of knowledge.
- **2.** Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
- 3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
- 4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

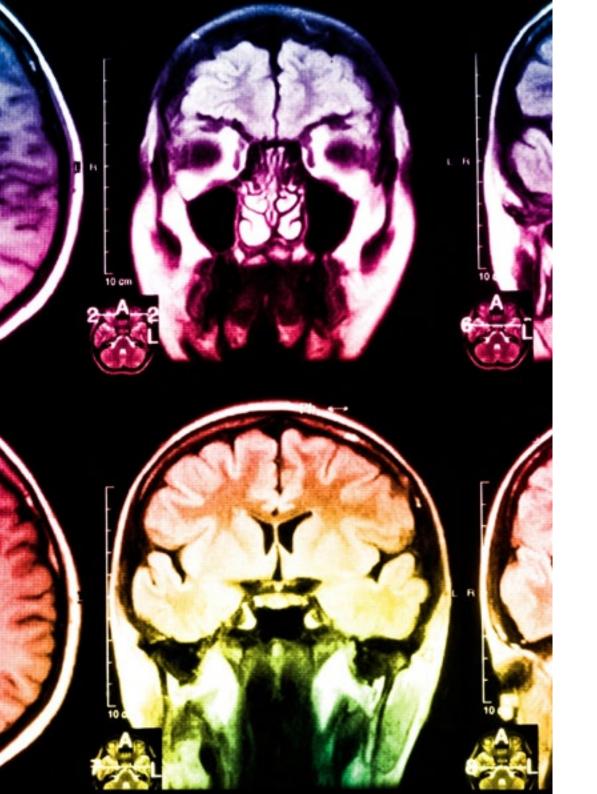


The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the teaching quality, the quality of the materials, the structure of the program and its objectives is excellent. Not surprisingly, the institution became the top-rated university by its students according to the global score index, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.



# tech 40 | Study Methodology

As such, the best educational materials, thoroughly prepared, will be available in this program:



#### **Study Material**

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

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



### **Practicing Skills and Abilities**

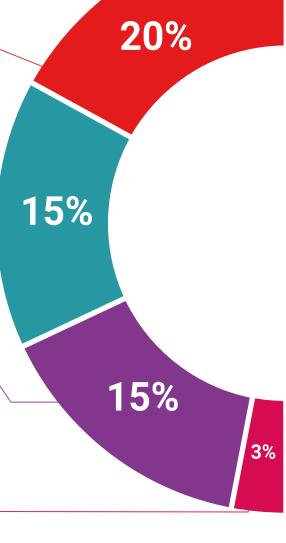
You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



#### **Interactive Summaries**

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

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".





#### **Additional Reading**

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

# Study Methodology | 41 tech

Case Studies

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.



**Testing & Retesting** 

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



**Classes** 

There is scientific evidence suggesting that observing third-party experts can be useful.





**Quick Action Guides** 

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



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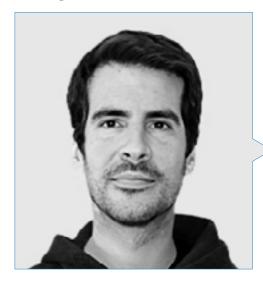
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# tech 44 | Teaching Staff

## Management



### Mr. Sola, Javier

- CEO of Training4ll
- Coach of the WT UAE team
- Head of Performance Massi Tactic UCI Women's Team
- Biomechanics Area Specialist for Jumbo Visma UCI UCI WT
- WKO advisor for World Tour cycling teams
- Trainer at Coaches 4 Coaches
- Associate Professor at Loyola University
- Graduate in Physical Activity and Sport Sciences from the University of Seville
- Postgraduate Degree in High-Performance Cycling Sports from the Murcia University
- Level III Sports Director
- Numerous Olympic medals and medals in European Championships, World Cups and National Championships.

#### **Teachers**

#### Mr. Raúl Celdrán

- CEO of Natur Training System
- Nutrition Manager of the BH ProConti Team
- MTB Klimatiza Team Performance Manager
- Trainer at Coaches 4 Coaches
- Degree in Pharmacy from the University of Alcalá, Spain.
- Master's Degree in Nutrition, Obesity and High Performance in Cyclic Sports from the University of Navarra.

# Mr. Moreno Morillo, Aner

- Kuwait National Cycling Team Performance Manager
- Assistant of Euskaltel-Euskadi ProConti Team
- National Sports Director Level III
- Graduate in Physical Activity and Sport Sciences from the Isabel I University.
- Master's Degree in CAFD Research from the European University.
- Master's Degree in High Performance Cycling Sports from the Murcia University.

#### Mr. Xabier Artetxe Gezuraga

- Performance Manager of the WT INEOS Grenadiers team.
- Professor and event director of the company Fundación Ciclista Euskadi
- Coach of the WT Movistar, SKY and INEOS Grenadiers teams.
- Sports director and coach of Seguros Bilbao, Caja Rural, Euskaltel Development Team.
- Coach of winners of Grand Tours, World Championships, Olympic medals and national championships.
- Trainer at Coaches 4 Coaches
- Master's Degree in High Performance in Biomedicine
- Certificate World Tour Level Sports Director
- Level III Sports Director

#### Mr. Heijboer, Mathieu

- Performance manager of the WT Jumbo-Visma team.
- Coach of high level cyclists
- Former professional cyclist
- Degree in Physical Activity and Sport Sciences (CAFD)

#### Mr. Jon Iriberri

- CEO of Custom4us
- Head of Biomechanics at WT Jumbo-Visma Team
- Head of Biomechanics at Movistar Team
- Professor at the UCI World Cycling Center.
- Degree in Physical Activity and Sports Sciences from the University of the Basque Country.
- Master's Degree in High Performance from Colorado State University. United States

#### Dr. Arguedas Lozano, Chema

- CEO of Plan Your Rides
- Cycling Coach and Expert in Intensive Cycling Nutrition
- Coach, Physical Trainer and Expert in Sports Nutrition
- Professor of Sports Nutrition at the University of Leioa.
- Author of titles related to Cycling: Plan your pedaling, Nourish your pedaling, Plan your mountain bike rides and Power your pedaling.



A unique, essential and decisive learning experience to boost your professional development"





# tech 48 | Certificate

This private qualification will allow you to obtain a **Master's Degree in Professional Cycling** 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** private qualification 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.

TECH is a member of the distinguished professional organization **The Chartered Association of Sport and Exercise Sciences (CASES)**. This membership reaffirms its commitment to excellence in management and specialized training in the sports field.

### Accreditation/Membership





Title: Master's Degree in Professional Cycling

Modality: online
Duration: 12 months.
Accreditation: 60 ECTS





# Master's Degree **Professional Cycling**

- » Modality: Online
- » Duration: 12 months.
- » Certificate: TECH Global University
- » Accreditation: 60 ECTS
- » Schedule: at your own pace
- » Exams: online

