

## **Program. Professional Diploma in Strength and Conditioning**

### **Proposal justification**

A program that offers the possibility to broaden knowledge in a cross-disciplinary way, as it covers topics such as nutrition, workload, injuries, and strength training, all of which are essential for daily professional practice.

### **Objetives**

- Improve critical analysis by completing a training program on the different professional roles of sports science and health.
- Improve sports performance and injury prevention through a deepened understanding of the methodology to use in strength training and muscle power programs.
- Apply the appropriate methodology to the design of the post-injury rehabilitation process in situations where strength development plays a significant role.
- Have a broad understanding of the emerging methodologies of strength training in order to explore these with the benefit of a solid scientific foundation.
- Get to know the fundamental characteristics for both prevention strategies and injury rehabilitation, as well as the different injury mechanisms in team sports.
- Handle pathologies and specific injuries corresponding to each sport.
- Use the appropriate tools to develop effective leadership in the management of groups and individuals.
- Optimize acute recovery and training adaptation with nutrition.
- Analyze workload monitoring data to orientate the training process towards preventing injuries and consequently successfully optimize sports performance.

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### **Competences to be developed**

Improve sports performance and injury prevention through an in-depth understanding of strength training methodologies.

- Apply appropriate methodology to the design of post-injury rehabilitation processes.
- Understand emerging methodologies of strength training based on solid scientific foundations.



- Identify fundamental characteristics for prevention strategies and injury rehabilitation.
  - Manage pathologies and specific injuries in different sports.
  - Use tools for effective leadership in group and individual management.
  - Optimize recovery and training adaptation through nutrition.
  - Analyze workload monitoring data to prevent injuries and optimize performance.
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### **Graduate profile**

Graduates will be equipped to analyze, design, and implement training programs for strength and conditioning, integrating methodologies of performance improvement, injury prevention, rehabilitation, and workload monitoring. They will be able to work as strength and conditioning coaches, physiotherapists, rehabilitation specialists, or sports scientists within teams, federations, clinics, and sports organizations.

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### **Target audience**

Strength and conditioning coaches, physiotherapists, and rehabilitation professionals.

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### **Syllabus**

#### **Course 1: Neuromuscular basis for strength training**

- Module 1: Characteristics of the musculoskeletal system
    - Unit 1: Movement from the central nervous system.
    - Unit 2: Function of the skeletal muscles.
  - Module 2: Muscle action and its relationship to sports
    - Unit 1: Types of muscle action.
    - Unit 2: Interrelationship of muscle action in movement and posture maintenance.
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- Module 3: Systemic changes in detraining and immobilisation
  - Unit 1: Detraining in relation to the skeletal muscle.
  - Unit 2: Muscle hypertrophy.
- Module 4: Assessment of muscular properties in relation to sport
  - Unit 1: Surface electromyography.
  - Unit 2: Tensiomyography.

**Course 2: Strength training methodology: its application in the improvement of sports performance and post-injury rehabilitation for competition**

- Module 1: Contextualization: how can we adapt strength training to team sports?
  - Unit 1: Strength and its relationship to the coordination and cognitive requirements of team sports.
  - Unit 2: Progression in the difficulty of the strength workload in relation to the specificity of the sport.
- Module 2: Strength workload methodology in situation sports
  - Unit 1: Strength training and the need to work with overload.
  - Unit 2: Integrating strength workload with the other capabilities.
- Module 3: Integrating strength workload into planning and programming of situation sports
  - Unit 1: Strength in the integrated training of long-term regular league class programming. Examples based on football.
  - Unit 2: Strength in the integrated training of blocks of preparation – competition programming. Examples based on tennis.
- Module 4: Strength in the design of sports specific tasks. Examples based on football
  - Unit 1: Small-sided games (SSG): characteristics for their design and the relationship with the development of sports ability.
  - Unit 2: SSG in relation to strength workload.



### **Course 3: Strength and muscle power as a key feature of rehabilitation from sports injuries**

- Module 1: Analysis of injury in sports: injury mechanisms and associated risk factors
  - Unit 1: Injury biomechanics and the implications of strength in the recovery of athletic skills.
  - Unit 2: Risk factors associated with lack of strength.
- Module 2: Sports injuries and their relationship with the quality of strength
  - Unit 1: Injuries in muscle and tendon structures.
  - Unit 2: Joint injuries.
- Module 3: Strength manifestations and muscle power in the post-injury rehabilitation process
  - Unit 1: Strength and its different manifestations according to external load and speed of execution.
  - Unit 2: Strength workload programming in sports injuries.
- Module 4: New paradigms in strength training: muscle building through vascular occlusion
  - Unit 1: Basis of traditional muscle building vs. muscle building through blood flow restriction (BFR).
  - Unit 2: Programming of training through blood flow restriction: key variables for optimal prescription.

### **Course 4: Technology, strength training and muscle power**

- Module 1: Technology, equipment and general strength training
  - Unit 1: Equipment for the general orientation workload with respect to the specific nature of sports.
  - Unit 2: Other equipment related to the general orientation loads.
- Module 2: Technology, equipment and specific strength training in relation to sports



- Unit 1: Equipment for directed and specific orientation workloads related to the specific abilities of sports.
- Unit 2: GPS technology and its relationship to the evaluation and control of strength in training and competition.
- Module 3: Technology in strength and muscle power evaluation
  - Unit 1: Use of lineal and rotating encoders for the evaluation of strength and muscle power.
  - Unit 2: Integrated systems in muscle assessment.
- Module 4: Interactive technology and strength training
  - Unit 1: Gamification in sports.
  - Unit 2: Interactive methodologies related to gamification.

#### **Course 5: Injuries and Team sports**

- Module 1: Prevention of and readaptation from injuries.
- Module 2: Muscle injury and tendinitis management.
- Module 3: Management of joint and bone injury.
- Module 4: Decision making and returning to competition.

#### **Course 6: Team Sports Pathology**

- Module 1: Management of medical pathology 1.
- Module 2: Management of medical pathology 2.
- Module 3: Sports Specific pathologies.
- Module 4: Special sports and competitions.

#### **Course 7: Basic Coaching Skills**

- Module 1: Leadership.
- Module 2: Communicational Tools.
- Module 3: Motivational Climates.
- Module 4: Coaches and their Environment.



### **Course 8: Nutrition, Recovery and Training Adaptations**

- Module 1: Exercise and fatigue.
- Module 2: Recovery and adaptation.
- Module 3: Optimising recovery and adaptation.
- Module 4: Recovery from injury.

### **Course 9: A Best Practice Approach to Workload Monitoring**

- Module 1: Why do injuries occur?
- Module 2: Fitness-fatigue model.
- Module 3: Acute:chronic workload ratio and injury.
- Module 4: Recent controversies, and practical applications of the data.

