

Course Code	Course Name	Credits
26PE511	Scientific Principles of Sports Training	04

Course Objectives

- Introduce the meaning, aims, principles, and importance of sports training.
- Explain overload, adaptation, and supercompensation in training.
- Understand methods for developing strength, speed, endurance, flexibility, and coordination.
- Apply training systems such as interval, circuit, plyometric, and fartlek training.
- Analyse training planning through micro, meso-cycle and macro cycles and periodization.
- Evaluate doping, its types, effects, and anti-doping regulations in sports.

Learning Outcomes

Upon successful completion of this course, it is intended that a student will be able to:

- Understand basic concepts and principles of sports training.
- Apply training methods to improve physical fitness components.
- Analyse overload, adaptation, and training effects on performance.
- Evaluate structured training plans using periodization concepts.
- Understand doping types, side effects, and control measures in sports.

Unit 1 - Introduction

Sports training: Definition Aim, Characteristics, Principles of Sports Training, Over Load: Definition, Causes of Over Load, Symptoms of Overload, Remedial Measures Super Compensation Altitude Training Cross Training

Unit 2 - Strength, Speed and Endurance

Strength: Methods to improve Strength: Weight Training, Isometric, Isotonic, Isokinetic Circuit Training, Speed: Methods to Develop Speed: Repetition Method, Downhill Run, Parachute Running, Wind Sprints, Endurance, Methods to Improve Endurance: Continuous Method, Interval Method, Repetition Method, Cross Country, Fartlek Training

Unit 3 - Flexibility and Coordinative ability

Flexibility: Methods to Improve the Flexibility- Stretch and Hold Method, Ballistic Method, Special Type Training: Plyometric Training. Training for Coordinative abilities: Methods to improve Coordinative abilities: Sensory Method, Variation in Movement Execution Method, Variation in External Condition Method, Combination of Movement Method, Types of Stretching Exercises.

Unit 4 - Training Plan

Training Plan: Micro cycle, Meso-Cycle, Macro Cycle. Short Term Plan and Long-Term Plans - Periodization: Meaning, Single, Double and Multiple Periodization, Preparatory Period, Competition Period and Transition Period.

Unit 5 - Doping

Definition of Doping Genetic doping and Technological doping - Side effects of drugs Dietary supplements IOC list of doping classes and methods. Blood Doping: The use of erythropoietin in blood boosting, Blood doping control, Protocol of Blood testing, WADA, NADA.

Reference Books:

1. BeotraAlka, (2000), Drug Education Handbook on Drug Abuse in Sports. Delhi: Sports Authority of India. I
 2. Bunn, J .N. (1998) Scientific Principles of Coaching, New Jersey Engle Wood Cliffs, Prentice Hall Inc.
 3. Cart, E. KlafsandDaniel, D. Arnheim (1999) Modern Principles ofAthletic Training St.
 4. Louis C. V Mosphy Company
 5. Daniel, D. Arnheim (1 99 1) Principles of Athletic Training, St. Luis, Mosby Year Book - David R. Mottram (1996) Drugs in Sport, School of Pharmacy, Liverpool: John Moore University A - Gary, T. Moran (1997) Cross Training for Sports, Canada : Human Kinetics
 6. Hardayal Singh (1991) Science of Sports Training, New Delhi, DVS Publications
 7. Jensen, C.R. and Fisher A.G. (2000) Scientific Basic of Athletic Conditioning, Philadelphia
 8. Ronald, P. Pfeiffer (1998) Concepts of Athletics Training 2nd Edition, London: Jones and Bartlett Publications
- YograjThani (2003), Sports Training, Delhi: Sports Publications.