

<b>POLI</b> ESCOLA SUPERIOR EDUCAÇÃO COMUNICAÇÃO DESPORTO  <b>TÉCNICO</b> <b>GUARDA</b>	<h2>SUBJECT DESCRIPTION</h2>	<b>MODELO</b> PED.012.03
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<i>Course</i>	<b>Sports, Fitness and Health</b>					
<i>Subject</i>	<b>Physical Exercise Physiology</b>					
<i>Academic year</i>	2023-2024	<i>Curricular year</i>	2nd	<i>Study period</i>	1st semester	
<i>Type of subject</i>	Compulsory	<i>Student workload (H)</i>	Total: 135	Contact: 60	<i>ECTS</i>	5
<i>Professor(s)</i>	Carolina Júlia Félix Vila-Chã					
<input checked="" type="checkbox"/> <i>Area/Group Coordinator</i> <input type="checkbox"/> <i>Head of Department</i>	<i>(select)</i> Carolina Júlia Félix Vila-Chã					

### COMPLETED SUBJECT DESCRIPTION

#### 1. LEARNING OBJECTIVES

The student should be able to:

- a) Understand the importance of exercise physiology in understanding the effects of physical exertion on fitness and health;
- b) Understand the physiological changes of the neuromuscular, cardiovascular and respiratory systems induced by different categories of physical exercise;
- c) Describe and understand the functioning of the basic energetic system, according to characteristics of the physical exercise and / or training performed;
- d) Understand the role of hormone system in regulating metabolism during exercise and its effect on chronic adaptations to exercise;
- e) Understand the effects of anaerobic and aerobic physical exertion on the physical condition and health of human beings;
- f) Understand the mechanisms of regulation and control of cardiorespiratory function during exercise;
- g) Understand and properly apply methodologies for assessing cardiorespiratory and neuromuscular function at rest and during exercise.

#### 2. PROGRAMME

A. Introduction to Exercise Physiology

B. Production and Regulation of Voluntary Movement

B.1. Structure and Function of the Skeletal Muscle System

B.2. Muscle neural control

B.3. Acute and chronic neuromuscular adaptations to physical exercise

C. Exercise Muscle Metabolism

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- C.1. Metabolic adaptations to exercise and its implications for Physical exercise
- D. Hormonal Regulation During Exercise
  - D.1. Hormonal regulation of metabolism and fluid and electrolytes during exercise
  - D.2. Acute and chronic exercise responses
- E. Cardiorespiratory Responses to Exercise
  - E.1. Acute Cardiorespiratory Adaptations to Exercise
  - E.2. Chronic adaptations to aerobic and anaerobic exercise
- F. Physical Exercise in Extreme Environments
  - F.1 Body temperature regulation
  - F.2. Altitude exercise
  - F.3. Health risks during exercise in extreme environments
- G. Physical and Physiological assessment of neuromuscular and cardiorespiratory function

### 3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

The learning objectives defined for this course aim to provide students with fundamental knowledge and skills for understanding, assessing and prescribing the exercise in order to increase the physical fitness of their future clients. Thus, the syllabus is consistent with the objectives of the course, because:

4. All syllabus aims to achieve point a) of the objectives;
5. Points B, D and E of the syllabus aim to achieve point b) of the objectives;
6. Point B of the syllabus aims to achieve point c) of the objectives;
7. Point D of the syllabus aims to achieve point d) of the objectives;
8. Point E of the syllabus aims to achieve point e) of the objectives;
9. Points E and F of the syllabus aim to achieve point f) of the objectives;
10. Point G of the syllabus aims to achieve the point g) of the objectives.

### 11.MAIN BIBLIOGRAPHY

- Haf, G.G., & Dumke, C. (2012). Laboratory manual for Exercise Physiology. Champaign: Human Kinetics.
- Kenney, WL, Wilmore, JH. ; Costill, DL. (2021): Physiology of Sport and Exercise. 8th edition. Human Kinetics.
- Kraemer, W., & Fleck, S. (2011). Exercise Physiology: Integrating Theory and Application. Philadelphia: Lippincott Williams & Wilkins.
- Mcardle, WD, Katch, FI., Katch, VI.(2018): Exercise Physiology – Energy, Nutrition, and Human performance (9th ed.). Lippincott Williams & Wilkins.
- Murray, R. & Kenney, W.L. (2020): Practical Guide to Exercise Physiology: The Science of Exercise Training and Performance Nutrition (2nd ed.). Human Kinetics.
- Poortmans, J. & Boisseau, N. (2013): Bioquímica das Atividades Físicas e Desportivas. Edições Piaget.

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Powers, SK., Howley, ET. (2020): Exercise physiology: theory and application to fitness and performance (11th ed.) McGraw-Hill Education.

Rebecca, T., & Christopher, G. (2013): Physiological tests for elite athletes. Champaign: Human Kinetics.

## **12.TEACHING METHODOLOGIES (INCLUDING EVALUATION)**

Classes are composed of theoretical and theoretical-practical sessions. To achieve the proposed objectives, the methodology used is based on principles of theoretical and practical training. The applied pedagogical methods and techniques imply an expository method with the observation of models and visualization of small illustrative films of the studied systems and the group interaction method with the purpose of the consolidation/systematization of the approached contents and their applicability in the different categories of physical exercise.

The frequency assessment focuses on student performance in the following components/tests: 2 evaluation sheets (70%) and group work (analysis of scientific articles, laboratory work and presentation) (30%). If the minimum final grade is not reached (9.5 val.), there will be an exam whose weighting of the final grade is 100%.

## **13.COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES**

The methodologies chosen were selected in order to maximize the acquisition of the contents associated with each objective:

1. Exposure of content (orally and through digital means) – this methodology is used to display the content associated with all learning objectives;
2. Research work, analysis and interpretation of text/scientific articles – this methodology was used primarily to consolidate the content associated with the objectives defined in points b), f) e g);
3. Application of knowledge in practical classes through the implementation of laboratory activities and preparation of reports – this methodology is used to consolidate the acquisition of content-associated objectives defined in points b), d), and e).

## **14.ATTENDANCE**

According to the regime applied at ESECD.

## **15.CONTACTS AND OFFICE HOURS**

Email: [cvilacha@ipg.pt](mailto:cvilacha@ipg.pt)

Attendance: Monday from 10:30 am to 12:30 pm; Tuesday from 14:00 to 16:00 and Thursday from 9:00 to 12:00.

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**16.OTHERS**

Nothing to declare.

**DATE**

**10 de outubro de 2023**

**SIGNATURES**

Professor and Area Coordinator

Carolina Vila-Cha

(signature)