

### Caraterização da Unidade Curricular / Characterisation of the Curricular Unit

<b>Designação da Unidade Curricular / Curricular Unit:</b>	[3181200609] Anatomofisiologia II [3181200609] Anatomophysiology II		
<b>Plano / Plan:</b>	2007/2008		
<b>Curso / Course:</b>	Desporto e Atividade Física Sport and Physical Activity		
<b>Grau / Diploma:</b>	Licenciado		
<b>Departamento / Department:</b>	CDM - Ciências do Desporto e Motricidade		
<b>Unidade Orgânica / Organic Unit:</b>	Escola Superior de Educação de Viseu		
<b>Área Científica / Scientific Area:</b>	Ciências da Motricidade		
<b>Ano Curricular / Curricular Year:</b>	1		
<b>Período / Term:</b>	S2		
<b>ECTS:</b>	4		
<b>Horas de Trabalho / Work Hours:</b>	0108:00		
<b>Horas de Contacto/Contact Hours:</b>			
(T) Teóricas/Theoretical:	0045:00	(TC) Trabalho de Campo/Fieldwork:	0000:00
(TP) Teórico-Práticas/Theoretical-Practical:	0000:00	(OT) Orientação Tutorial/Tutorial Orientation:	0000:00
(P) Práticas/Practical:	0000:00	(E) Estágio/Internship:	0000:00
(PL) Práticas Laboratoriais/Practical Labs:	0000:00	(O) Outras/Others:	0000:00
(S) Seminário/Seminar:	0000:00		

### Docente Responsável / Responsible Teaching

[2038] Francisco Emiliano Dias Mendes

### Outros Docentes / Other Teaching

[2124] Ricardo Manuel Mateus Oliveira

### **Learning Outcomes of the Curricular Unit**

1. Know and understand the structure and function of the nervous system.
2. Characterize the structure of skeletal muscle and explain the process of muscle contraction.
3. Understanding the energy metabolism and describe the respective fundamental energy systems.
4. Apply basic knowledge of bioenergetics.
5. Identify, describe and explain the structure and function of the cardiovascular system.
6. Identify, describe and explain the structure and function of the respiratory system.
7. Understanding the interrelationship between the formation and function of each system discussed.
8. Understanding the coordination between the systems that constitute the human being.

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### **Syllabus (Lim:1000)**

1. Functional Structure of the Nervous System: Central Nervous System; Peripheral Nervous System (Autonomic and Somatic); nerve cell (neuron); Rest Potential and Action Potential; Synapse.
2. Musculoskeletal System: skeletal muscle physiology; the process of muscle contraction.
3. Energy Metabolism and Bioenergetics: carbohydrates, lipids and proteins; formation of ATP; aerobic and anaerobic glycolysis; oxidative phosphorylation; oxidation of lipids; system of phosphocreatine (PCr); removal and metabolism of lactate.
4. Cardiovascular System: cardiac muscle tissue; anatomy of the heart; cardiac cycle; regulation of heart activity; coronary arteries and veins; circulatory system; blood.
5. Respiratory System: anatomy; pulmonary ventilation; alveolar-capillary diffusion; transport of gases in the blood; internal respiration; regulation of the respiratory system.

### **Demonstration of the syllabus coherence with the curricular units' learning objectives**

Demonstration of the syllabus coherence with the curricular units' objectives: The first objective is achieved by the syllabus listed in item 1.

The second objective is achieved by the syllabus listed in item 2. Objectives 3 and 4 are achieved by the syllabus listed in item 3. The objective 5 is achieved by the syllabus listed in item 4.

The objective 6 is achieved by the syllabus listed in item 5.

It is essential for students to understand the complicity and strong inter-relationship between the nervous, respiratory, cardiovascular, metabolic and musculoskeletal systems in order to realize the source, regulation and coordination of all human action. The transversal field of the syllabus allows goals number 7 and 8 of the course to be achieved.

### **Teaching Methodologies (Including evaluation; Lim:1000)**

At the beginning of each theoretical lesson there is always a review of the topics covered in the previous class, focused on the most important elements, proceeding then to answer questions submitted by students. The structure of each class should contain elements of increasing difficulty, should be done pauses and change of pace from exposure as well as moments of questioning students. The theoretical class has as auxiliary of exposure an iconography updated and illustrative with the appropriate visual aids. The materials used in class are available on the digital platform (moodle).

Normal assessment: two written test (50%+50%); Approved if equal or greater than 9,5.

Special Evaluation: the students should do the assignments describe in normal assessment. If they are unable to do the evaluation moments, they should contact the professor in the first fortnight of classes.

Exam and/or Final Exam

### **Demonstration of the coherence between the teaching methodologies and the learning outcomes**

Curricular unit process develops through theoretical classes where the physio-morphology of physical activity is rationalized allowing students to understand morphologic and functional interaction as cause of all activity. In these classes it is essential to use the media in order to better understand the functional structure of the systems discussed. The use of practical examples and questioning to involve students in the problems under study, it is essential to achieve the objectives. As such, we want the students beyond the acquisition of theoretical knowledge, be able to apply them and tailor them to the reality of physical activity and sports training. The implementation of theoretical knowledge to their practical applicability is essential not only in terms of motivational for the student, but by understanding the usefulness of the subjects covered for the remaining subject areas and consequently for their professional future.

The curricular unit evaluation is organized and equitably distributed in two different moments, in the middle and end of semester, promoting a systematic study by students.

**Bibliografia / Bibliography (Lim:1000)**

Kenney, W.L. e Murray, B. (2020). Practical Guide To Exercise Physiology - The Science Of Exercise Training And Performance Nutrition. 2ªEdição. Human Kinetics Publishers.

Kenney, W.L., Wilmore, J.H. e Costill, D.L. (2019). Physiology of Sport and Exercise. 7ª Edição. Human Kinetics.

McArdle, W.D., Katch, F.I. e Katch, V. L. (2016). Fisiologia do exercício. Nutrição, energia e desempenho humano. 8ªEdição. Editora Guanabara Koogan Ltda. Rio de Janeiro.

Pezarat Correia, P. e Espanha, M. (2010). Aparelho Locomotor: Anatomofisiologia dos Sistemas Nervoso, Osteoarticular e Muscular. Edições FMH. Lisboa.

Pezarat Correia, P. (2010). Aparelho Locomotor: função neuromuscular e adaptações à atividade física. Edições FMH. Lisboa.