

Course Unit	Natural Sciences		Field of study	-	
Master in	Teaching of the First Cycle, Mathematics and Natural Sciences in the Second Cycle		School	School of Education	
Academic Year	2023/2024	Year of study	1	Level	2-1
Type	Semestral	Semester	2	ECTS credits	5.0
Code	5044-763-1201-00-23				
Workload (hours)	135	Contact hours	T -	TP 35	PL -
			TC -	S -	E -
			OT 10	O -	

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Adorinda Maria Rodrigues Pereira S. Gonçalves, Paulo Miguel Mafra Gonçalves

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Know concepts of atomic structure and relate them with radioactive phenomena.
2. Relate de atmospheric circulation and ocean circulation and its impacts on the environment.
3. Explain the influence of man in the evolution of atmosphere and Earth's climate.
4. Explain essential concepts in geology, namely, the genesis of rock, linking the different stages of the cycle petrogenético.
5. Discuss the need for a balanced management of natural resources and the impact of humans on the environment.
6. Explain the occurrence of chromosomal and gene abnormalities and discuss the hereditary transmission of certain human diseases.
7. Substantiate the importance of photosynthesis, respiration, fermentation and decomposition in ecosystem functioning.
8. Develop research activities including laboratory work to resolve problem situations.

Prerequisites

Before the course unit the learner is expected to be able to:
No pre-requisitos.

Course contents

The atmosphere and oceans; conservation of energy; from energy sources to the user -the global energy situation; Recycling of constituent materials of the Lithosphere and petrogenético cycle; The use of geological resources and human impacts on the environment; From cell to multicellular organism; Mutations and mutagens; Human heredity; From cell to the ecosystem.

Course contents (extended version)

1. The atmosphere and the oceans:
 - Evolution, characteristics, and structure of the atmosphere;
 - Modifications of the atmosphere by anthropogenic action;
 - Atmospheric circulation, oceans circulationand earth climate.
2. Conservation of energy:
 - Mechanical energy and work;
 - Internal Energy, Heat and Temperature - Heat transfer;
 - Emission and absorption of radiation;
 - Conservation of energy and energy balances - Laws of Thermodynamics.
3. Energy sources to the user - the world energy situation:
 - Rational use of energy sources and new energy sources;
 - Radioactivity and Nuclear energy.
4. Recycling of constituent materials of the lithosphere (Cycle petrogenetic):
 - Main types of rock and its origin;
 - Training of soil and relief.
5. The use of geological resources and human impacts on the environment.
6. From cell to multicellular organism (human species).
 - Gametogénese, ovulação, fecundação e nidação;
 - Mutations and mutagens: gene mutations and chromosomal mutations;
 - Numerical and structural chromosomal abnormalities (some hereditary diseases);
 - Human heredity.
7. The cell to the ecosystem:
 - Germination, photosynthesis and respiration and their importance to the living beings;
 - Decomposition and their importance to the ecosystems.

Recommended reading

1. Amabis, J. & Martho, G. (2007). Fundamentos da Biologia Moderna. São Paulo: Editora Moderna.
2. Goldsby, K. & Chang, R. (2012). Química. Lisboa: McGraw-Hill de Portugal, Lda.
3. Lopes, S. (2010). Bio, volumes: 1, 2 e 3. São Paulo: Editora Saraiva.
4. Velho, J. L. (2006). Os recursos minerais - uma visão geohistórica. Viseu: Palimage Editores.
5. Uyeda, S. (1992). Uma nova Concepção da Terra. Lisboa: Editora Gradiva.

Teaching and learning methods

The UC is developed using a variety of methodologies. Includes theoretical and practicval sessions where situations are discuss, requiring the involvement of students, as well as the research of some proposed topics, performed in small groups, subsesequently presented to the class. There will also be activities for laboratory and field work, as well opportunity to make individual and group work.

Assessment methods

1. Continous Evaluation - (Regular, Student Worker) (Final)
 - Development Topics - 50% (Realization and presentation of group work.)
 - Intermediate Written Test - 50% (Written test.)
2. Rating by exam - (Regular, Student Worker) (Supplementary, Special)
 - Final Written Exam - 50% (The final written exam correspond to the written test.)
 - Development Topics - 50% (Realization and presentation of group work (frequency assessment).)

Language of instruction

Portuguese

Electronic validation

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