

Course Unit	Current Themes in Sciences		Field of study	Natural Sciences	
Master in	Science Education		School	School of Education	
Academic Year	2020/2021	Year of study	1	Level	2-1
Type	Semestral	Semester	1	ECTS credits	10.0
Code	5016-627-1104-00-20				
Workload (hours)	270	Contact hours	T -	TP 36	PL 36
			TC -	S -	E -
			OT 18	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, Carlos Manuel Mesquita Morais, Delmina Maria Pires

Learning outcomes and competences

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

1. Explain the importance of the knowledge development about the structure of the materials for the development of new products and new applications.
2. To know concepts of atomic structure and relate them to radioactive phenomena to discuss the influence of radioactivity on the environment.
3. Discuss the results of recent studies in the area of biotechnology and apply the knowledge obtained in debates on GMOs and transgenic.
4. Recognize and describe mutagens consequences of genetic changing.
5. Assess the impact of environmental biotechnology and food in quality of life and ecosystems.
6. Understand the need for a balanced management of natural resources and man's impact on the environment.
7. Use concepts, representations and mathematical procedures in different contexts and in connection with other knowledge and understanding of reality situations.

Prerequisites

Before the course unit the learner is expected to be able to:
Does not apply.

Course contents

1. Structure and properties of materials; 2. The role of biotechnology and micro-organisms in society; 3. The sustainable resource use and the impact of human activity on the environment; 4. Mathematics and reality.

Course contents (extended version)

1. Structure and properties of materials:
 - Matter and Radiation;
 - New materials.
2. The role of biotechnology and micro-organisms in society:
 - Genetically Modified Organisms. Ethical, social and safety aspects;
 - Reproductive and therapy cloning;
 - Microorganisms and food and medicines production, and sustainable environmental biotechnology;
 - Science-technology-society-environment. Relationships, interactions and impacts.
3. Sustainable resource use and impact of human activity on the environment:
 - Fossil fuels and mineral resources, water and soil. Alternative energy;
 - Environmental problems caused by human intervention: environmental pollution, waste production;
 - Sustainable development.
4. Mathematics and reality:
 - Succession of Fibonacci and other regularities;
 - Representation and interpretation of data in daily life.

Recommended reading

1. Canhoto, J. M. (2010). Biotecnologia Vegetal - Da Clonagem de Plantas à Transformação Genética. Coimbra: Imprensa da Universidade de Coimbra.
2. Corbalán, F. (2005). La matemática aplicada a la vida cotidiana. Barcelona: Editorial Graó.
3. Freitas, M. C. (2005). Geologia e Ambiente - Recursos Geológicos. Lisboa: Universidade Aberta.
4. Jones, L. , & Atkins, P. W. (2011). Princípios de Química - Questionando a vida moderna e o meio ambiente (5.ª Edição). Bookman Ed.
5. Lopes, S. (2010). Bio, volumes: 1, 2 e 3. São Paulo: Editora Saraiva.

Teaching and learning methods

It is privileged the analysis and reflection of texts and articles, followed by discussion in large group, as well as the identification/ construction/discussion of teaching strategies diversified related to the syllabus. Will also be carried out practical activities, some laboratory, related to certain programmatic items.

Assessment methods

1. Continuous assessment - (Regular, Student Worker) (Final)
 - Development Topics - 50% (Individual research, on the topics treated, presented in writing and with discussion in a big group.)
 - Presentations - 50% (Work that will involve a practical component and will be subject to final presentation.)
2. Assessment by examination - (Regular, Student Worker) (Supplementary, Special)
 - Final Written Exam - 50% (The exam will focus only on the theoretical.)
 - Development Topics - 50% (Work with final presentation (frequency evaluation).)

Language of instruction

Portuguese

Electronic validation

Adorinda Maria Rodrigues Pereira S. Gonçalves, Carlos Manuel Mesquita Morais, Delmina Maria Pires	Paulo Miguel Mafra Gonçalves	Delmina Maria Pires	António Francisco Ribeiro Alves
02-12-2020	11-12-2020	11-12-2020	12-12-2020