

**COURSE DATA****Data Subject**

Code	43574
Name	Basic science
Cycle	Master's degree
ECTS Credits	3.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
2161 - M.U. en Prevención de Riesgos Laborales 12-V.2	Faculty of Social Sciences	1	First term

Subject-matter

Degree	Subject-matter	Character
2161 - M.U. en Prevención de Riesgos Laborales 12-V.2	1 - Fundamentals of occupational health and safety	Obligatory

Coordination

Name	Department
DELGADO PINAR, MARTINA	175 - Applied Physics and Electromagnetism
FERRER ROCA, CHANTAL MARIA	175 - Applied Physics and Electromagnetism
VERDU ANDRES, JORGE	310 - Analytical Chemistry

SUMMARY

Prevention technicians constantly require a basic scientific knowledge in their work. This course proposes an acquisition and reminder of concepts and basic tools in physics, chemistry and biology, necessary in the study of those occupational disciplines that involve quantification, measurement and control of different occupational risks and therefore are scientific and technologically founded, such as Industrial Hygiene, Safety, Occupational Medicine, Health and Prevention or Ergonomics.



PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

Los contenidos que se trabajan en esta asignatura constituyen parte del temario de ciencias (física y química, biología) de la ESO y bachillerato.

OUTCOMES

2161 - M.U. en Prevención de Riesgos Laborales 12-V.2

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Trabajar en equipos multidisciplinares reproduciendo contextos reales vinculados con el bienestar social y la intervención familiar, aportando y coordinando los propios conocimientos con los de profesionales de otras áreas, desde una posición crítica con carácter constructivo.
- Desarrollar la capacidad para analizar nuevos problemas de forma rigurosa y sistemática.
- Ser capaz de escribir y presentar adecuadamente informes científicos con los fundamentos, métodos, resultados y discusión de los estudios empíricos realizados.

LEARNING OUTCOMES

English version is not available

DESCRIPTION OF CONTENTS

1. Magnitudes: units and uncertainty

The International System of Units, SI. Decimal prefixes and change of units. Precision and accuracy. Uncertainty and significant figures.

2. Energy

Energy: Basic concepts and relationships. Conservation and transformation of energy. Thermal energy and heat: relationship with temperature and transmission mechanisms. Power and intensity



3. Vibrations and waves. The harmonic case

Vibrations. Characterization of harmonic vibrations (amplitude and period-frequency) and their representation. Concept of wave as propagation of vibrations and its the harmonic case: vibration magnitudes plus the phase, speed of propagation and wavelength. Types of waves. Energy and intensity of a wave, variation with distance to the source. Waves of special interest: sound and electromagnetic and their spectrum.

4. Matter Structure and composition

States of matter aggregation and changes of state. General and specific properties of matter. Matter structure: elements, compounds and mixtures. The atomic model and the Periodic system. Structure of the atom: isotopes and radioactivity.

5. Gases and mol concept

Avogadro number and mol concept. Law of ideal gases. Mixtures of gases: Dalton's law. Vapor pressure. Expression of the concentration: conversion between volumetric concentrations and mass concentrations.

6. Solutions

Solutions: solvent and solute. Expression of concentration: conversion between different units.

7.

Microorganisms as etiological agents of infection and / or disease in humans.

Causes of Disease. The cell. Pathogens: viruses, bacteria, fungi, protozoa, helminths and arthropods. Sterilization and disinfection: antimicrobial agents.

8. Epidemiology of diseases by biological agents

Pathogenicity mechanisms. Infection chain. Epidemiology of infectious diseases. Prevention of infectious diseases.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	20,00	100
Classroom practices	10,00	100
Study and independent work	15,00	0
Preparation of evaluation activities	20,00	0
Preparation of practical classes and problem	10,00	0
TOTAL	75,00	

TEACHING METHODOLOGY

Given the eminently practical nature intended for this subject, during lectures, the exposition of theoretical concepts will be interspersed with problem solving activities and related practical exercises. Depending on the cases they will be solved by the teacher or by students, individually or in groups. This lecture room work will be reinforced by the completion of different evaluable homework activities related to the subject, in the specified allotted time, with the double objective of strengthening the concepts worked in the lecture hall and to monitor students learning, as well as prior preparation of the content to be developed in the lecture room.

EVALUATION

English version is not available

REFERENCES**Basic**

- Principios de química: los caminos del descubrimiento P. Atkins y L. Jones. Editorial Médica Panamericana, 2005.
- "Física Conceptual", Paul G. Hewitt, Pearson Educación.
- "Física para la ciencia y la tecnología. Tipler, p. A.; Mosca, G. Vol 1, Editorial Reverté, 2005.
- Microbiología LM Prescott, JP Harley, DA Klein. McGraw- Hill Interamericana, 2004.

Additional

- Libros de texto de ciencias Física y química y Biología de 3º y 4º de la ESO (cualquiera)
- Curso de Física Interactivo Hyperphysics de la Georgia State University (en inglés): <http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>
- Química R. Chang y K.A. Goldsby. McGraw-Hill Educación. 2013.
- Introducción a la microbiología. Tortora GJ, Funke BR, Case CL, 9ª ed. Editorial Médica Panamericana, 2007.

