UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Chemistry

2223-4-G8501R036-G8501R036M

Course title

Topics and course structure

The course presents the basic concepts of chemistry applied to concrete experiences in relation to the more general themes set out in the 2012 National Indications: chemistry as a bridge science between the various disciplines, evolution of thought in relation to the transformations of matter, the macroscopic and microscopic worlds, the composition of matter, states of aggregation, atomic structure and periodic properties of the elements, ionic bond, covalent bond, metallic bond, examples of chemical reactions: combustion, decomposition, oxidation, acid-base reactions, synthesis, hydrolysis, the shape of molecules and intermolecular forces, in-depth study of the relationship between density and viscosity, hydrophilic, hydrophobic, amphiphilic substances and concrete examples in nature, air chemistry and water chemistry in relation to climate; national and European legislation on the teaching of chemistry and science in general. The course is structured in lectures and practical experiences that can form a teaching path for primary school students.

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Objectives

By means of this teaching, with constant and participative attendance of the lectures and the Laboratory connected to the course, we intend to PROMOTE the following learning in terms of

- Knowledge and understanding
- Ability to relate differentiated knowledge and models
- Ability to apply knowledge and models

Methodologies

Lectures, use of films, active teaching methods, experiences, suggestions for experiments at home, metacognitive reflections in relation to learning, discussion on communicating basic chemistry concepts to primary school students.

Online and offline teaching materials

Handouts in the form of slides uploaded on the E-learning site.

Books

Use of Internet sites for in-depth study

Programme and references for attending students

As an indication, the lecture blocks will follow this outline:

- Chemistry as a bridge science between the various disciplines, evolution of man's thinking in relation to the nature of matter.
  Chemistry as a bridging science between the various disciplines,
  evolution of thought in relation to the transformations of matter,
  the macroscopic and microscopic worlds,
  the composition of matter, states of aggregation,
  the atomic structure and periodic properties of the elements,
  the ionic bond, the covalent bond, the metallic bond,
  examples of chemical reactions: combustion, decomposition, oxidation, acid-base reactions, synthesis, hydrolysis,
  the shape of molecules and intermolecular forces,
  in-depth study of the relationship between density and viscosity,
  hydrophilic, hydrophobic, amphiphilic substances and concrete examples in nature,
  air chemistry and water chemistry in relation to climate;
  biomolecules: carbohydrates, lipids, proteins and nucleic acids
  national and European legislation on the teaching of chemistry and science in general.

Bibliography

Laura Cipolla, I quaderni della didattica. Metodi e strumenti per l’insegnamento e l’apprendimento della

chimica. EDISES.

Bibliografia consigliata

2) Philip Ball, Elementi.

3) Peter Atkins, Il Regno periodico

4) Aldersey-Williams Hugh Favole Periodiche

5) Primo Levi, Il sistema periodico

Programme and references for non-attending students

Non-attending students must bring the same syllabus as the attending students and the bibliography is the same.

Assessment methods

- Written and oral
  The written test consists of a multiple-choice test (closed and open-ended questions) aimed at ascertaining knowledge of the basics of biology, after which there is a written phase with open-ended questions in which, in addition to knowledge of biology, the ability to correctly explain the information learnt and make connections will be assessed.

The oral test (if the written tests are passed) is optional, at the candidate's choice; it will start from the written test, and will then extend to the verification of knowledge of the entire programme and of what has been learnt in the laboratories.

Office hours

To be agreed at the beginning of the course

Programme validity

The programme is running for one academic year

Course tutors and assistants

Sustainable Development Goals

QUALITY EDUCATION | GENDER EQUALITY | LIFE ON LAND