



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Chimica Generale

2627-1-E1302Q009

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#### Aims

- Introduction to chemistry (language and methodologies)
- Knowledge of the basic chemical principles important to study biological processes

In particular, the course of General Chemistry will give the students the basis of chemistry, focussed on biological systems.

#### 1. Knowledge and understanding

The student will gain knowledge of the chemical principles at the basis of general chemistry useful for the comprehension of biological systems.

#### 2. Applying knowledge and understanding

The student will be able to apply the knowledge acquired under 1. to the subsequent subjects, especially organic chemistry and biochemistry.

#### 3. Making judgements

The student will be able to process the acquired knowledge in general chemistry towards its application to the interpretation of basic chemical issues in living systems.

#### 4. Communication skills

Use of an appropriate scientific/chemical vocabulary and ability in oral reports

#### 5. Learning skills

Skills in reading and understanding the subsequent studies needing a solid general chemistry basis, skills in the application of general chemistry knowledge to other subjects requiring basic chemistry prerequisites.

#### Contents

Structure of matter

Aggregation states of matter  
Control of chemical reactions  
Chemistry of water solutions  
Electrochemistry

## Detailed program

Structure of matter

- Atomic structure and description of subatomic particles.
- Electronic configurations of atoms and periodic properties.
- Chemical bonds. Lewis structures. VSEPR theory. Atomic and molecular orbitals.

Aggregation states of matter

- Gases
- Liquids
- Solids
- Solutions

Reaction rates

- Rate of reactions and factors affecting rate of reactions. Catalysis.
- Thermodynamics.
- Chemical equilibria.

Chemistry of water solutions

- Acids and bases
- pH, pOH e pK<sub>w</sub>. Calculations of pH in different water solution.
- Coordination chemistry
- Redox reactions

Electrochemistry

- Electrochemical cells. Nerst equation.

## Prerequisites

Elementary Mathematics and Physics

## Teaching form

32 2 hours-lectures of delivered didactics (Didattica erogativa, DE) focused on the presentation-illustration of contents by the lecturer.

Didactic activities are conveyed by means of face-to-face lectures.

## Textbook and teaching resource

- Chimica - J.C.Kotz, P-Treichel Jr. - EdiSES
- Slides can be found at the Moodle webpage related to the teaching module

## **Semester**

First semester

## **Assessment method**

Written exam where the student must solve stoichiometry exercises.

Oral exam where the topics covered in class are discussed. There are no ongoing assessments. T

The oral exam, graded out of thirty, consists of an interview in which the student must respond clearly and using proper language to open-ended questions related to the aspects and themes discussed during the lessons. The final grade will take into account the evaluation of the written and oral exams, with the following scale: 18-21: preparation on a limited part of the course topics, with poor ability in treatment and independent analysis which in the oral exam only emerges with the teacher's help and questions; presentation skills sometimes uncertain, vocabulary not always clear and accurate, sometimes incorrect, with very limited critical development ability; 22-24: knowledge of a good number of course topics, though not always consistent, with sufficient ability to discuss and analyse independently, sometimes prompted by the teacher's questions; clear enough presentation, generally correct vocabulary, though sometimes inaccurate or unclear, limited critical thinking; 25-27: good knowledge of a wide range of course topics, ability to argue and analyse critically with good independence, ability to apply knowledge to real cases, correct vocabulary and competence in disciplinary language; 28-30/30L: complete and thorough knowledge of exam topics, ability to discuss and analyse topics independently, ability to link themes to real cases and various contexts and disciplines, excellent critical and independent thinking skills, full mastery of disciplinary vocabulary

## **Office hours**

Monday 15:30-17:30

## **Sustainable Development Goals**

LIFE ON LAND

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