



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### General Chemistry

2122-1-E1301Q009

---

#### 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

Frontal Lessons alternated with exercises on the subjects carried out.

## 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 examination where the student has to solve some numerical problems about stoichiometry and answer one or more theoretical question.

Oral examination where topics are discussed from a theoretical standpoint.

## **Office hours**

Monday 15:30-17:30

---