



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Laboratorio di Chimica Generale e Inorganica

2324-1-E0201Q048-E0201Q058M

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#### Aims

The laboratory is aimed at learning the basic techniques used in a chemistry lab in general and inorganic chemistry, applying the basic theoretical concepts of acid-base and redox chemistry. The student also learns some safety and behavior rules in a chemistry laboratory.

Ability to apply knowledge and understanding. At the end of the course, students will be able to use the basic techniques of the chemical laboratory (preparation of solutions, transfer of quantities) and apply them in basic techniques of analytical chemistry (titers).

Ability to apply knowledge and understanding. At the end of the laboratory the student will be able to correctly interpret the analytical chemistry data analysis results, to recognize the salient aspects and to collect and process experimental data.

Autonomy of judgment. Among the objectives of the laboratory there is the development of a critical vision of the basic techniques of analytical chemistry and their results.

Communication skills. At the end of the workshop the student will be able to re-elaborate the experimental data obtained through the basic techniques of analytical chemistry and present them in the most appropriate way (graphics, tables, etc.) with an appropriate language and with the appropriate typical technical terms.

Learning ability. The student will be able to discuss the results obtained from basic analytical chemistry analysis whose application is required for the determination of the unknown concentration of a solute in dilute aqueous solution. It is also expected that these laboratory experiments may be of interest to the student in understanding what his / her attitudes towards scientific experimentation.

#### Contents

The general chemistry laboratory consists of experiments in the field of determination of solute concentration in diluted aqueous solutions using basic techniques of quantitative analytical chemistry.

## Detailed program

The general chemistry practical lessons consist of 6 experiments.

- Acid-base titration of hydrochloric acid with sodium carbonate with methyl orange indicator;
- Redox titration of hydrogen peroxide with a solution of potassium permanganate standardized with sodium oxalate;
- Iodometric titration of commercial sodium hypochlorite (bleach) with sodium thiosulfate;
- Acid-base pHmetric titration of acetic acid with sodium hydroxide;
- Acid-base pHmetric titration of phosphoric acid in an unknown solution and in coca-cola with sodium hydroxide.
- Colorimetric analysis of a diluted solution of  $\text{Fe}^{2+}$ .

## Prerequisites

Background: basic knowledge of stoichiometry and general and inorganic chemistry.

Prerequisites: none

## Teaching form

Chemistry laboratory practicals. The attendance to practicals is mandatory (75% of module hours).

Teaching language: italian.

## Textbook and teaching resource

Learning material (to help students carry out lab experiences) will be provided in lab at the beginning of each single experience.

M. Bruschi, "Stechiometria e laboratorio di chimica generale" Pearson

## Semester

Second semester

## Assessment method

Written examination in the form of lab reports.

The student will be evaluated according to two criteria: the first concerns the judgment that has been formed on the basis of the "practical skill" level that students have achieved; the second deals with the evaluation of reports that students will have to prepare at the end of the course. Such reports will be focused on both formal and practical issues of each single experience.

## **Office hours**

Contact: on demand, upon request by mail to lecturers

## **Sustainable Development Goals**

QUALITY EDUCATION

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