UNIVERSITÀ DI PAVIA

## Anno Accademico 2018/2019

# BIOINORGANIC CHEMISTRY AND LAB

| | |
|---|---|
| **Enrollment year** | 2017/2018 |
| **Academic year** | 2018/2019 |
| **Regulations** | DM270 |
| **Academic discipline** | CHIM/03 (GENERAL AND INORGANIC CHEMISTRY) |
| **Department** | DEPARTMENT OF CHEMESTRY |
| **Course** | CHEMISTRY |
| **Curriculum** | PERCORSO COMUNE |
| **Year of study** | 2° |
| **Period** | 2nd semester (01/03/2019 - 20/06/2019) |
| **ECTS** | 6 |
| **Lesson hours** | 60 lesson hours |
| **Language** | Italian |
| **Activity type** | ORAL TEST |
| **Teacher** | DELL'ACQUA SIMONE (titolare) - 3 ECTS<br>NICOLIS STEFANIA - 3 ECTS |
| **Prerequisites** | = |
| **Learning outcomes** | Bioinorganic Chemistry Module.<br>The module aims to develop topics of general and inorganic chemistry partially introduced in previous courses, with particular regard to the chemistry of metallic compounds, in order to provide students with the tools to understand the mechanisms of action of some classes of metalloproteins and metalloenzymes of greatest biological interest.<br><br>Laboratory of Bioinorganic Chemistry Module.<br>The laboratory aims to illustrate several chemical, biotechnology and spectroscopic techniques in order to understand the structure and reactivity of metalloproteins and metalloenzymes of great biological interest. |

## Course contents

Bioinorganic Chemistry Module
The topics covered are as follows: electrons, elements of quantum mechanics; atoms, atomic orbitals and periodic properties; molecules, chemical bond and molecular orbitals; introduction to coordination chemistry, stability, isomerism, ligand field stabilization energy, magnetic properties, kinetics and reaction mechanisms; binding of oxygen and other small molecules to metals; metalloproteins and metalloenzymes, classification and functions; electron transport proteins; oxygen transport proteins; enzymes containing heme iron, non-heme iron and copper centers.

Laboratory of Bioinorganic Chemistry Module.
The main topics covered are as follows: enzyme kinetics; UV-visible, NMR and CD spectroscopy; electron transfer reactions in biological systems. The study of these issues will be explored through the following laboratory experiments: kinetic study of oxidation reactions catalyzed by peroxidase and enzyme inhibition; NMR characterization of substrates and products; use of algorithms for the simulation of complex electron transfer protein-enzyme (docking); acid-base titration and CD spectroscopy of electron transfer proteins.

## Teaching methods

=

**Reccomended or required readings**

=

## Assessment methods

=

## Further information

=

| | |
|---|---|
| | $lbl_legenda_sviluppo_sostenibile |