



## GENERAL AND INORGANIC CHEMISTRY (SURNAMES A-K)

<b>Enrollment year</b>	2020/2021
<b>Academic year</b>	2020/2021
<b>Regulations</b>	DM270
<b>Academic discipline</b>	CHIM/03 (GENERAL AND INORGANIC CHEMISTRY)
<b>Department</b>	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
<b>Course</b>	BIOLOGICAL SCIENCES
<b>Curriculum</b>	PERCORSO COMUNE
<b>Year of study</b>	1°
<b>Period</b>	(05/10/2020 - 14/01/2021)
<b>ECTS</b>	9
<b>Lesson hours</b>	76 lesson hours
<b>Language</b>	Italian
<b>Activity type</b>	WRITTEN TEST
<b>Teacher</b>	NICOLIS STEFANIA - 9 ECTS
<b>Prerequisites</b>	=
<b>Learning outcomes</b>	The course aims to give to the students the basic chemical background needed to understand the chemical aspects of biological systems.
<b>Course contents</b>	Atoms: atomic and mass numbers, isotopes, radioactivity, atomic and molecular weights, molar mass. Atomic structure, atomic orbitals, quantum numbers, energy and filling of the orbitals. Electronic configuration. Periodic table and periodic properties. Nomenclature. Ionic, covalent and metallic chemical bonds. Covalent bond: diatomic molecules, sigma and pi-greek bonds, geometry of polyatomic molecules, resonance, formal charges, structural formulas, exceptions to the octet rule, hybrid orbitals. Polarity in covalent bonds and dipole moment. Intermolecular forces, hydrogen bonding. Chemical reactions: classes of reactions, stoichiometric coefficients, balance, yield. States of

aggregation. Mixtures: suspensions, colloids and solutions. Liquid solutions: concentration, density, dilution, titration, electrolyte solutions, colligative properties. Chemical kinetics. Chemical equilibrium: equilibrium constant, reaction quotient, Le Chatelier's principle. Acids and bases: Bronsted-Lowry theory, acids and conjugate bases, pH,  $K_a$ , hydrolysis, buffer solutions, polyprotic acids, Lewis acids and bases, acid-base titrations, indicators. Solubility equilibria. Thermodynamics. Electrochemistry. Laboratory exercises: redox titration, acid-base titration, potentiometric determination of the pH of buffer solutions.

**Teaching methods**

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**Reccomended or required readings**

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**Assessment methods**

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**Further information**

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**Sustainable development goals - Agenda 2030**

[\\$|bl legenda sviluppo sostenibile](#)