

General Information	
Academic subject	General and Inorganic Chemistry
Degree course	Degree in Science and Management of Maritime Activities
Curriculum	
ECTS credits	7
Compulsory attendance	yes
Language	italian

Subject teacher	Name Surname	Mail address	SSD
	Francesca Chiaia Noya	francescaciaianoya@virgilio.it	CHIM03

ECTS credits details			
Basic teaching activities	Frontal lessons and distance learning	ppt	exercises

Class schedule	
Period	first semester
Year	2020-2021
Type of class	

Time management	
Hours	56
In-class study hours	
Out-of-class study hours	

Academic calendar	
Class begins	09/11/2020
Class ends	20/02/2021

Syllabus	
Prerequisites/requirements	Acquire general knowledge of the basic principles of chemistry for understanding and deepening the topics covered in subsequent courses
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	<p><i>Knowledge and understanding</i> Acquire general knowledge of the basic principles of chemistry for understanding and deepening the topics covered in subsequent courses</p> <p><i>Applying knowledge and understanding</i> the student solves specific problems having the knowledge of the methodologies to be applied</p> <p><i>Making informed judgements and choices</i> the student interprets the experimental data, decides if they are relevant</p> <p><i>Communicating knowledge and understanding</i> At the end of the course, the student should have acquired sufficient language properties, as regards the specific scientific terminology of the teaching and will acquire the ability to</p>

	<p>interpret the properties and material transformations based on the structure of atoms and molecules</p> <p><i>Capacities to continue learning</i> At the end of the course of study the student will have developed the ability to understand some chemical and physical characteristics of substances, such as state of aggregation and volatility, hardness and fragility on the basis of the knowledge of their structure. He will know how to make a spontaneity balance of chemical and electrochemical processes and quantify the mass and energy involved during these transformations and will be able to evaluate the pH of a solution.</p>
<p>Contents</p>	
<p>Course program</p>	<p>The atom: Generalities, quantum and wave theory, orbitals, periodic system of elements, principle of maximum multiplicity. Chemical bonds: Bond forces, covalent bond, dative bond, ionic bond, hydrogen bond, metal bond, electronegativity, ionization potential, electron affinity. The mole: Atomic weight, molecular weight, equivalent weight. States of matter: the gaseous state, definition of ideal gas, state variables, ideal gas laws, real gases. The liquid state, properties of liquids, viscosity, vapor pressure, boiling temperature. The solid state, covalent solids, ionic solids, molecular solids, metallic solids.</p> <p>State changes: Definition, water state diagram and comparison with that in the presence of a non-volatile solute. Solutions: Concentration, solubility, Raoult's law, colligative properties (cryoscopic lowering, ebullioscopic raising, osmotic pressure). Chemical reactions and energy: The energetic aspect of chemical reactions (Enthalpy and Entropy) Homogeneous chemical equilibria: law of masses, expression of the equilibrium constant.</p> <p>Heterogeneous equilibria: generalities, application of the law of the masses to heterogeneous equilibria. Equilibrium in solution: acids and bases, degree of dissociation, buffers, hydrolysis, pH indicators, acid-base titration. Solubility product. Acid-base titrations and solubility curves. Redox potential: cells, concentration cells, potentiometric determination of pH, Nernst equation. Hints of inorganic chemistry exercise on the topics covered. Notes on the production of ammonia, sulfuric acid, notes on the soda-chlorine process and molten salts.</p>
<p>Bibliography</p>	<p>Masterton - Hurley - Chemistry (principles and reactions) - Ed. Piccin G.I. Sackheim, D.D. Lehman - Chemistry for Biomedical Sciences - EdiSES - Naples. Powerpoint presentations</p>
<p>Notes</p>	

Teaching methods	The course is divided into a series of lectures held with the help of the projection of PowerPoint and PDF presentations. The slides used to support the lessons will be provided before the start of the course in the students classroom. The slides are considered an integral part of the teaching material.
Assessment methods (indicate at least the type written, oral, other)	Verification of preparation consists of a written and an oral test.
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are.	Students must demonstrate: full mastery in identifying and applying the fundamental laws of basic chemistry; ability to critically evaluate the results concerning the stoichiometry of chemical reactions; clarity and completeness in the oral presentation of the program contents
Further information	the didactic activities make use of supports such as computer presentations that are made accessible to students through the microsoft teams platform