

ACADEMIC YEAR 2023/2024

General information	
Academic subject	FUNDAMENTALS OF CHEMISTRY
Degree course	Science of Marine Productions and Resources (L38)
Academic Year	I year
European Credit Transfer and Accumulation System (ECTS)	6
Language	Italian
Academic calendar (starting and ending date)	I semester
Attendance	Mandatory

Professor/ Lecturer	
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Tutoring (time and day)	To be agreed by e-mail

Syllabus	
Learning Objectives	<ul style="list-style-type: none"> • Knowledge and understanding <ul style="list-style-type: none"> - Know the main concepts of chemistry useful for the work of the specialist of marine production and resources; - Know the role of chemistry in the working context of the specialist of marine production and resources; - Acquire the methodology necessary for learning and mastering the discipline; - Develop the ability to work independently both both individually and in groups; - Develop critical study and argumentation skills to share, compare and question one's own ideas and those of others. • Applied knowledge and understanding <ul style="list-style-type: none"> - Know the basic and applicative concepts for a correct chemical culture of the specialist of marine productions and resources; • Making judgments <ul style="list-style-type: none"> - Know and learn the appropriate use of chemical tools useful for the activity of the specialist of marine products and resources; • Communication skills <ul style="list-style-type: none"> - Know and analyze the methodological aspects that regulate the activity of the specialist of marine production and resources - under the chemical aspect; • Ability to learn <ul style="list-style-type: none"> - Learn the specialized chemical skills that the specialist of sea productions and resources must possess, through a direct vision in the field;
Course prerequisites	Elementary knowledge of General and Inorganic Chemistry and of the nomenclature of organic chemistry.



Contents	<ul style="list-style-type: none"> - Introduction to the course, States of matter, periodic table of chemical elements, Dalton's atomic theory, the atom, isotopes, mole, Avogadro's number. - Chemical formulas and chemical reactions, equilibrium and stoichiometry, periodic properties of the elements, the chemical bond. - The phenomenon of resonance, the oxidation number with calculation exercises. Ionic and covalent compounds, hybrid orbitals. - Intermolecular chemical bonds. Gases and the equation of state of ideal gases. Expression of concentration. Chemical kinetics and catalysis. - Chemical equilibrium, acid-base equilibrium. Le Chatelier's principle, strength of an acid and a base. Electrochemistry, balancing redox reactions with exercises. - IUPAC nomenclature, nomenclature of binary, ternary, ionic compounds. - Outline of the nomenclature of organic compounds, hydrocarbons, alkanes, alkenes, alkynes, cycloalkanes, aromatic hydrocarbons, aldehydes and ketones. - Notes on the structural isomerism of alkenes. Aromatic hydrocarbons and the resonance phenomenon.
Books and bibliography	Lecture notes, Prof. Pasquale Giungato
Additional materials	

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
150	48	0	102
ECTS			
6	6	0	0
Teaching strategy			
The course is developed through frontal lessons relating to the aspects of the discipline that are relevant and indispensable for the achievement of the specific educational objectives of the teaching and global objectives of the study program. During the lessons, various tools are used to achieve the educational objectives such as, for example, power point presentations projected in the classroom, diagrams, bibliographic indications.			
Expected learning outcomes			
Knowledge and understanding on:	Knowledge of the principles, concepts, tools and methodologies of general chemistry. o Ability to understand the strategies for solving elementary stoichiometry problems.		
Applying knowledge and understanding on:	Ability to apply the general concepts learned in the course to solve simple stoichiometric problems. This expected ability will be the result of practical applications with exercises that the student will be asked to solve.		
Soft skills	<ul style="list-style-type: none"> • Making judgments • The student will have to acquire his own autonomy in solving simple problems such as preparing solutions and balancing simple reactions. 		



	<ul style="list-style-type: none"> • Communication skills • The student will have to acquire the ability to discuss and above all disseminate the fundamental concepts of the subjects of study, as well as the results obtained in a clear and exhaustive way by adjusting the technical level according to the end users, using the correct scientific language. The exercises carried out during the lessons contribute to the achievement of this objective. • Ability to learn independently. <p>The expected results concern the ability to integrate basic knowledge also through the retrieval of web resources from institutional sites.</p>
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Assessment and feedback	
Methods of assessment	<p>The student assessment includes:</p> <ul style="list-style-type: none"> - an oral test which generally consists of three questions relating to different topics of the course. <p>The score of the exam is attributed by means of a vote expressed out of thirty. It generally considers: i) the student's participation in the lessons ii) the student's participation in the critical discussion of the exercises. An excellent grade is the result of meeting most of the evaluation criteria.</p>
Evaluation criteria	<ul style="list-style-type: none"> • Knowledge and understanding: <ul style="list-style-type: none"> ○ Minimum level for passing the exam: basic knowledge of the fundamentals of chemistry and of the IUPAC nomenclature for inorganic chemical compounds and some of the organic ones. ○ Intermediate level: moderate knowledge of the basics of chemistry and of the IUPAC nomenclature for inorganic chemical compounds and some of the organicones. ○ Upper level: in-depth knowledge of the fundamentals of chemistry and of the IUPAC nomenclature for inorganic and some organic chemical compounds. • Applied knowledge and understanding: <ul style="list-style-type: none"> ○ Minimum level for passing the exam: basic knowledge of the tools of general chemistry and the nomenclature of inorganic compounds and some organic compounds. ○ Intermediate level: know at a moderate level the tools of general chemistry and the nomenclature of inorganic compounds and some organic compounds. ○ Upper level: have advanced knowledge of the tools of general chemistry and the nomenclature of inorganic compounds and some organic compounds. • Making judgments: <ul style="list-style-type: none"> ○ Ability to solve simple stoichiometric problems independently. • Communication skills: <ul style="list-style-type: none"> ○ For all levels: demonstrate knowledge of the correct scientific terminology, relating to the knowledge required for the three levels, and explain the topics of the exam questions with proper language. • Ability to learn: <p>In carrying out the exam, the proposed topics will have an increasing degree of depth in order to establish at which level of knowledge, fundamental, intermediate and superior, the student's learning ability has reached.</p>



Criteria for assessment and attribution of the final mark	Assessment of the acquisition of theoretical notions (through oral exam), and of the ability to integrate the notions learned with respect to the program developed. <ul style="list-style-type: none">○ From 1 to 17: Students do not have a basic knowledge of the tools of general chemistry and the nomenclature of inorganic compounds and some organic compounds.○ From 18 to 24: Students have a basic knowledge of the tools of general chemistry and the nomenclature of inorganic compounds and some organic compounds.○ From 25 to 27: Students have a fair level of knowledge of the tools of general chemistry and the nomenclature of inorganic compounds and some organic compounds.○ From 28 to 30 cum laude: The students have excellent knowledge of the tools of general chemistry and the nomenclature of inorganic compounds and some organic compounds.
Additional information	