



# UNIVERSITÀ DEGLI STUDI DI PALERMO

|                                     |   |
|-------------------------------------|---|
| <b>DEPARTMENT</b>                   | Scienze Agrarie, Alimentari e Forestali   |
| <b>ACADEMIC YEAR</b>                | 2017/2018   |
| <b>BACHELOR'S DEGREE (BSC)</b>      | AGRICULTURAL SCIENCES AND TECHNOLOGIES  |
| <b>SUBJECT</b>                      | GENERAL AND INORGANIC CHEMISTRY   |
| <b>TYPE OF EDUCATIONAL ACTIVITY</b> | A   |
| <b>AMBIT</b>                        | 50126-Discipline chimiche   |
| <b>CODE</b>                         | 01900   |
| <b>SCIENTIFIC SECTOR(S)</b>         | CHIM/03   |
| <b>HEAD PROFESSOR(S)</b>            | GIANNICI FRANCESCO Professore Associato Univ. di PALERMO  |
| <b>OTHER PROFESSOR(S)</b>           |   |
| <b>CREDITS</b>                      | 6   |
| <b>INDIVIDUAL STUDY (Hrs)</b>       | 90  |
| <b>COURSE ACTIVITY (Hrs)</b>        | 60  |
| <b>PROPAEDEUTICAL SUBJECTS</b>      |   |
| <b>MUTUALIZATION</b>                |   |
| <b>YEAR</b>                         | 1   |
| <b>TERM (SEMESTER)</b>              | 1° semester   |
| <b>ATTENDANCE</b>                   | Mandatory   |
| <b>EVALUATION</b>                   | Out of 30   |
| <b>TEACHER OFFICE HOURS</b>         | <b>GIANNICI FRANCESCO</b><br>Tuesday 16:00 18:00 edificio 17 di Viale delle Scienze, stanza 1/A3. Contattare il docente via email per concordare l'orario del ricevimento.<br>Thursday 16:00 18:00 edificio 17 di Viale delle Scienze, stanza 1/A3. |

DOCENTE: Prof. FRANCESCO GIANNICI

|                               |  |
|-------------------------------|--|
| <b>PREREQUISITES</b>          | Basic knowledge of secondary school chemistry.   |
| <b>LEARNING OUTCOMES</b>      | Knowledge concerns proper chemistry language and physical chemical properties of organic and inorganic matter. Chemical and physical transformation of molecules and their reaction in controlled environmental conditions are also investigated. Definition and expectation of qualitative and quantitative principles of inorganic chemistry.  |
| <b>ASSESSMENT METHODS</b>     | Final written and oral examination. The organic unity of the contents is evaluated as well as the students' ability to connect topics and issues and to explain them clearly. The evaluation is expressed with grades from 18 to 30. The final evaluation is based on the following criteria:<br>a) Basic minimal knowledge of the main fundamental notions of basic arguments (grade: 18-21);<br>b) A fair knowledge of the main main problems of applied chemistry(grade: 22-25); c) A good knowledge of the main problems and analysis of the topics and issues through a proper and precise language; ability to manage its main problems (grade: 26-28);<br>d) Optimal knowledge and analysis of the topics and issues of the program, dealt with in a coherent, precise, and scientific manner; optimal ability to recognize and control its main problems (grade 29-30L). |
| <b>EDUCATIONAL OBJECTIVES</b> | The educational objectives are modulated in order to obtain a proper use of chemistry, with a specific concern about language and laws of physical chemistry, to explain the interactions between organic and inorganic raw materials of interest for biochemistry, soil chemistry, environmental chemistry and plant physiology.  |
| <b>TEACHING METHODS</b>       | Lectures and exercises.  |
| <b>SUGGESTED BIBLIOGRAPHY</b> | Masterton - CHIMICA.PRINCIPI E REAZIONI - Piccin<br>Bandoli - CHIMICA DI BASE - Edises<br>Stoker – PRINCIPI DI CHIMICA - Edises  |

### SYLLABUS

| Hrs | Frontal teaching  |
|-----|---|
| 6   | States of matter. Elements, compounds, atoms, molecules, phases. Chemical and physical transformations. Conservation laws. Stoichiometry. Mole and molar mass. Periodic table. Concentration in mixtures and solutions. Inorganic nomenclature. |
| 3   | Acid-base reactions. pH and pOH.  |
| 4   | Electronic structure of atoms.  |
| 6   | Chemical bonding. Covalent, ionic, metallic bonding. Lewis structures. Resonance. Polarity. Electronegativity. Redox reactions.   |
| 3   | Perfect gas laws. Structure of solids and liquids. Phase transitions. Phase diagram of water.   |
| 6   | Solubility. Colligative properties.   |
| 4   | Chemical equilibrium. Mass action law. Equilibrium constant and reaction coefficient. Le Chatelier's principle.   |
| 6   | Equilibria in aqueous solutions. Bronsted-Lowry acids and bases. Water self-ionization. Polyprotic acids. Buffer solutions. Titrations. Precipitation reactions. Solubility product.  |
| 2   | Description of glassware and basic laboratory equipment.  |
| Hrs | Practice  |
| 20  | Numerical exercises on stoichiometry.   |