UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Fisica e Chimica - Emilio Segrè
ACADEMIC YEAR	2019/2020
BACHELOR'S DEGREE (BSC)	PHYSICS
SUBJECT	CHEMISTRY
TYPE OF EDUCATIONAL ACTIVITY	A
AMBIT	50160-Discipline chimiche
CODE	01788
SCIENTIFIC SECTOR(S)	CHIM/03
HEAD PROFESSOR(S)	GIANNICI FRANCESCO Professore Associato Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	94
COURSE ACTIVITY (Hrs)	56
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**GIANNICI FRANCESCO** 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. Thursday 16:00 18:00 edificio 17 di Viale delle Scienze, stanza 1/A3.

DOCENTE: Prof. FRANCESCO GIANNICI

PREREQUISITES	Knowledge required for being admitted to the degree course and verified through the admission test
LEARNING OUTCOMES	Knowledge and understanding of basic concepts in inorganic chemistry, physical chemistry and analytical chemistry: in particular, knowledge of the main topics of interest to physical sciences (e.g. chemical bonding, thermochemistry, electrochemistry) will be a primary outcome. Applying knowledge and understanding of the structure of matter, on the basis of the principles of chemistry; solving numerical exercises dealing with stoichiometry. Making judgments: Provide and interpret structure and properties of elements and of chemical compounds. Communication skills: Expose, in written and oral form, unexplained phenomena through the topics covered in the course. Learning skills: Designing laboratory experiments involving the preparation of known quantities of solid, liquid or gaseous samples.
ASSESSMENT METHODS	The final examination consists of a written test and of an oral exam. The written test, of the duration of about 2 hours, concerns the resolution of five stoichiometry exercises. The oral test consists of an interview on theoretical and practical aspects of the topics covered in the course. The final assessment, properly graded, will be made on the basis of the following conditions: a) sufficient knowledge of subjects and theories addressed in the course and sufficient explanation ability; sufficient degree of awareness and autonomy in the application of theories to solve chemical problems (rating 18-21); b) Good knowledge of subjects and theories addressed in the course and discrete explanation ability; fair degree of awareness and autonomy in the application of theories to solve chemical problems (rating 22-25); c) Good knowledge of subjects and theories addressed in the course and good explanation ability; good degree of awareness and autonomy in the application of theories to solve chemical problems (rating 26-28); d) Excellent knowledge of subjects and theories addressed in the course and excellent explanation ability; excellent level of awareness and autonomy in the application of theories to solve chemical problems (rating 29-30L).
EDUCATIONAL OBJECTIVES	The course aims at providing the student with basic knowledge and skills in the framework of general chemistry, to approach the study of matter in relation to its composition and to correlate its properties to molecular structure, from both theoretical and practical points of view. During practice, the student will learn to solve numerical problems of stoichimetry.
TEACHING METHODS	Teaching takes place in the second half of the first year and consists of lectures and numerical exercises
SUGGESTED BIBLIOGRAPHY	Chimica Moderna; D.W. Oxtoby, H.P. Gillis, A. Campion, V edizione; Edises, 2017 Eventuali approfondimenti sulla risoluzione degli esercizi possono essere trovati in: Fondamenti di Stechiometria; M. Giomini, E. Balestrieri, M. Giustini; Edises, 2009

SYLLABUS

Hrs	Frontal teaching
4	Constitution of matter. Atoms and atomic theory. Elements and compounds. Chemical reactions. Reactions in aqueous solution. Periodic table. Metals and non metals.
6	Chemical bond: introduction. Modern atomic theory. Chemical bond: insights and models.
2	Main classes of compounds and functional groups in Organic Chemistry
4	Ideal gases and real gases. Liquids, solids and phase diagrams. Solutions and their properties.
8	Thermochemistry. Gibbs free energy. Spontaneous reactions. Chemical equilibria: principles. Homogeneous and heterogeneous equilibria.
7	Acid-base equilibria. Solubility equilibria. Electrochemistry. Chemical kinetics.
1	The solid state. Atomic and electronic structure of solids. X-ray diffraction.

Hrs	Practice
8	Isotopic composition. Writing balanced chemical equations. Molecular structure. Ideal gases. Colligative properties.
10	Thermochemistry. Entropy and Gibbs free energy.Homogeneous and heterogeneous equilibria. Acid-base equilibria. Solubility equilibria. Electrochemistry.
6	Exercises on the final exam questions