



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2023/2024		
BACHELOR'S DEGREE (BSC)	CHEMISTRY		
SUBJECT	ORGANIC CHEMISTRY I		
TYPE OF EDUCATIONAL ACTIVITY	A		
AMBIT	50138-Discipline Chimiche		
CODE	01943		
SCIENTIFIC SECTOR(S)	CHIM/06		
HEAD PROFESSOR(S)	PACE ANDREA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	8		
INDIVIDUAL STUDY (Hrs)	132		
COURSE ACTIVITY (Hrs)	68		
PROPAEDEUTICAL SUBJECTS	00133 - GENERAL AND INORGANIC CHEMISTRY 15248 - CHEMICAL PREPARATIONS WITH LABORATORY PRACTICE		
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	PACE ANDREA Tuesday 9:00 10:00 Viale delle Scienze - Edificio 17 - Corridoio "Chimica Organica" Thursday 9:00 10:00 Viale delle Scienze - Edificio 17 - Corridoio "Chimica Organica"		

DOCENTE: Prof. ANDREA PACE

PREREQUISITES	Knowledge of basic principles of general chemistry. Atomic and molecular structure, chemical bond Ability to apply logic to the comparison of physical properties. Knowledge and ability to apply the concept of percentage and of proportions. Ability to draw simple geometrical shapes (triangles, squares, pentagons, hexagons and circles) and to identify 90, 120, and 180 degrees angles.
LEARNING OUTCOMES	Knowledge of traditional names and the IUPAC nomenclature for the common compounds Knowledge of principal physical and chemical properties of studied compounds Knowledge of principal reaction mechanisms Knowledge of chirality Knowledge of aromaticity Ability to link the IUPAC name to compounds structure and viceversa. Ability to derive physical, chemical and stereochemical information by compound structure. Ability to discuss a possible reaction mechanism on the base of reagents nature and reaction conditions. Ability to apply knowledge and comprehension of simple topic regarding organic questions. Ability to evaluate and to predict the behavior of a compound on the grounds of compound structure and its similarity with other studied compounds. Ability to expound the studied facts and theories regarding organic compounds. Ability to bring oneself up to date by means of scientific papers.
ASSESSMENT METHODS	Written test followed by oral exam. The written test consists of 10 questions, with a score of 1 point each, and 10 questions with a score of 2 points each, for a total score ranging between 0 and 30. With scores higher than or equal to 18 in the written test, the student will be admitted to the oral exam; the final score will consider both the written and oral tests evaluations. Each question requires writing a straightforward answer or drawing structures and reaction mechanisms. Typical examples of final tests are published in the portal or provided upon request. Each answer can receive partial scoring (at 0.25 incremental values) depending on the type and number of mistakes. For total scores having different than zero decimals, the final score will be rounded up to the next entire value. For instance, a score of 17,00 will be considered as failed exam, while a score of 17,25 will be rounded up to 18 and allows to pass the written test and be admitted to the oral exam. The oral examination will begin with a question regarding the writing of a compound structure of known IUPAC name. The student will be asked to describe the chemical behaviour and stereochemical aspect of the compound. The overall evaluation will be based on both results of the written and oral exams. The final score will be excellent (30-30 with laude) if the student shows a very good knowledge of items, very good analytical ability, and will be able to apply its knowledge for resolving problems. The evaluation score will be very good (26-29) if the student shows a good knowledge of items, good analytics ability, and is able enough to apply its knowledge for resolving problems. The score will be good (24-25) if the student shows a good knowledge of principal items, good analytics ability, and will be able to apply, when helped, its knowledge for resolving problems. The evaluation will be satisfactory (21-23) if the student shows a satisfactory knowledge of principal items, enough analytical ability, and will be able to apply, when helped, its knowledge for resolving simply problems. The score will be enough to pass the exam (18-20) when the student will show a minimal knowledge of principal items, scarce analytics ability, and will be not much able to apply its knowledge for resolving problems. The exam will not be passed if the student shows scarce and not acceptable knowledge of principal items.
EDUCATIONAL OBJECTIVES	The objective is to allow the student to understand the general aspects, fundamental principles and technical language/ formalisms of organic chemistry and let the student acquire knowledge of the various classes of organic compounds and reactions, of the chemical behaviour of functional groups associated to structural aspects. The Organic Chemistry course will be characterised by a descriptive and phenomenological approach. The different compounds classes, their structural and stereochemistry aspects, as well as the characteristic reactions will be presented as bases for studying molecules and processes characteristic of organic chemistry.
TEACHING METHODS	68 hours course (56 hours of lectures and 12 hours of practical sessions) with interactive involvement of students to gain real time feedback on concepts comprehension. In case of online remote teaching, lectures will be presented by live streaming.
SUGGESTED BIBLIOGRAPHY	W. H. Brown, C. S. Foote e B. L. Iverson, E. V. Anslyn, Chimica Organica (quinta edizione) EDISES

SYLLABUS

Hrs	Frontal teaching
2	Introduction to organic chemistry- Atoms of H, C, N, O, P, S and halogens. Electronic configuration, electronegativity, atomic orbitals and hybridization. The chemical bond in organic compounds, hybridization and resonance, bond polarity and molecule polarity, intermolecular interactions.

SYLLABUS

Hrs	Frontal teaching
4	Acid and bases in organic chemistry; comparing their strength on the basis of their molecular structure. Nucleophiles and electrophiles. The concept of Leaving Group.
4	Isomerism and Stereochemistry
3	Alkanes and Cycloalkanes
4	Alkenes and alkynes. Electrophilic addition and stability of carbocations
6	Alkyl halogenates. Nucleophilic substitution and elimination
5	Alcohols, thiols, ethers, epoxides
3	Amines
1	Organometallic compounds
5	Aldehydes and ketones
1	Tautomerism
4	Carboxylic acids and derivatives
4	Enolate anions and enamines
1	Coniugates dienes
6	Benzene, aromaticity and substitution aromatic reactions
3	IR and NMR spectroscopies, mass spectrometry. Basic concepts for the characterization of small organic molecules.
Hrs	Practice
12	Polarity of the molecules, intermolecular interactions, basicity and acidity order, identification of leaving group, electrophilic and nucleophilic sites, completing a chemical reaction, describing a reaction mechanism. Practical sessions will be held during or at the end of each lecture where the concept has been explained.