Course Title	**Organic Chemistry**				
Course Code	PHA211				
Course Type	Compulsory				
Level	BSc (Level 1)/ MPharm (Level 2)				
Year / Semester	2nd (3rd semester)				
Teacher's Name	Dr Maria Rikkou-Kalourkoti				
ECTS	6	Lectures / week	3+1*	Laboratories/week	2
Course Purpose	Since the vast majority of drugs and substances of pharmaceutical interest are organic compounds and most processes used are on organic compounds, it is evident that Organic Chemistry is fundamental for almost every subject of Pharmaceutical Sciences. The aim of this course is to provide students with a solid and good knowledge of Organic Chemistry, and, in particular, the preparation - production and the properties of the main groups of organic compounds. * tutorial				
Learning Outcomes	By the end of this course, the students will: • Analyze the atomic structure, chemical bond and hybridization of carbon and other heteroatoms • Use IUPAC rules to name organic molecules • Name the functional groups and different class of organic compounds. • Describe the methods and techniques for the preparation of the main groups of aliphatic compounds; • Recognise the mechanism of organic reactions concerning these groups of compounds; • • Distinguish aromatic compounds using Huckel Law • Recognize reactivity patterns of conjugated and aromatic molecules • • Predict the synthesis and properties of aliphatic aromatic and heteroaromatic compounds; • Use of nuclear magnetic resonance spectroscopy, mass spectrometry and infrared spectroscopy for organic structure elucidation • Understand the fundamental properties and reactivity of biological- ly important molecules (e.g. carbohydrates, amines and amino- acids) • Predict the stereochemistry of organic molecules and chirality • List and analyse the types of reactions performed in organic chemistry.				
Prerequisites	PHA101 General and Inorganic Chemistry		Corequisites	None	

Course Content	Nomenclature of organic compounds. Structure and bonding in organic compounds. Synthesis, properties, reactivity of alkanes, cycloalkanes, alkenes, alkynes, alkyl halides, alcohols, ethers, epoxides, amines, carbonyl compounds, monocyclic, polycyclic aromatic compounds organometallic compounds, sulphur containing compounds. Stereochemistry. Stereochemistry in organic reactions. Nucleophilic substitution, addition and elimination reactions, the involved mechanisms. Mechanisms of selected organic reactions, some name reactions. Separation of organic compounds using chemical and chromatographic techniques. Sugars and lipids. Spectroscopic methods (UV-vis, IR, NMR), mass spectrometry and structure elucidation of organic compounds. Electrophilic, nucleophilic aromatic substitution. Conjugates, dienes and isoprenoids. Introduction to Heterocyclic Chemistry. Polymerisation and polymers, biodegradable polymers. Establishing organic compound structures by modern physicochemical techniques (e.g. chemical, spectroscopic). **Laboratory experiments/exercises:** As part of the course, laboratory exercises are carried out on the course material for a better deepening and consolidation of the theoretical part. Indicative exercises are: separation methods and applications, recrystallization, melting points, extraction, TLC, distillation, S_N1 and S_N2 reactions, Grignard reactions and identification of carbonylic compounds Friedel-Crafts Reaction.
Teaching Methodology	Teaching methodology includes lectures to offer the theoretical back-ground and laboratory exercises / experiments to help better understand and concepts in organic chemistry. Tutorial time is used for solving exer-cises. PowerPoint presentations, picture-rich material, molecular models and short animations to better understand molecular geometry, stereochemis- try and the effect on chemical and physical properties are used in this course. Power point presentations are available to students through e- learning platform. During lectures students are challenged to participate in discussions, questions and answers and are guided to comprehend chemistry con-cepts/principles. Relevant problems are presented and solved in class and are also given to students for further practice. As part of the development of students' skills, laboratory exercises are carried out by the students (involving collection and analysis of data, ap- ply theory and draw conclusions, completion of laboratory reports). The evaluation of laboratory is based on written lab report submitted for each laboratory exercise.

Bibliography	(a) Textbooks: • "Organic Chemistry", J. McMurry, Greek translation of 9th American edition: 2017 Greek Publisher: University of Crete • "Organic Chemistry", J. McMurry, 9th edition, Cengage Learning, 2015 (b) References: • "March's Advanced Organic Chemistry", M.B. Smith, J. March, Wiley Interscience, 7th ed, 2013.
Assessment	• Written Mid-Term Exam: 30% • Laboratory Reports: 20% • Written Final Exam: 50% The evaluation of the course is performed by (a) a written mid-term exam during the semester, which examines specific modules of the course and it accounts for 30% of the overall grade, (b) the laboratory grade which accounts for 20% of the overall grade, and (c) a written final exam, which examines all modules of the course, and it accounts for 30% of the overall grade. Students are prepared for the above written exams by solving problems, related to the course content, in class, while additional problems are given to the students for further practice. Frequent revisions are also performed so as students to comprehend the various chemical concepts and princi- ples of techniques used in the field of study. The Mid-term and final exam- ination comprise of questions and numeric problems in order to evalu- ate the degree of understanding of the concepts and principles of chemis- try and the ability to apply theory in solving problems, which require to use more than one concept or equation as well as investigation and/or quanti- fication of equations. Laboratory grade is based on laboratory reports from the experiment work and one final examination. In Laboratory reports student must describe their experiment work (20 %), analyze their results (30%) and answer some critical questions (50%), to examine the degree of understanding of the concept of the laboratory exercise. The laboratory final exam com- prises of questions and numeric problems. The overall lab grade is calculated as shown in the equation: Lab grade = 0,60* (Average grade of laboratory reports) + 0,40* Lab final examination The final assessment of the students is formative and summative and is assured to comply with the subject's expected learning outcomes and the quality of the course.
Language	Greek, English