Course title	**General Chemistry**				
Course Code	**CHEM100**				
Course Type	**Theoretical and Laboratory**				
Level	**Diploma**				
Year / Semester	**1st Year / 1st Semester**				
Teacher's Name	**Tomouzou Chrysi**				
ECTS	6	**Lectures / week**	2	**Laboratories / week**	1
Course Purpose and Objectives	The main purpose of the course is for students to acquire basic knowledge of General, Inorganic and Organic Chemistry, which are essential for understanding and consolidating knowledge that the Medical Representative must possess.				
Learning Outcomes	Upon completion of the course, students are expected to: **Knowledge** 1. **Distinguish** the different chemical elements and **recognize** the main characteristics associated with them. 2. **List** the similarities, differences and peculiarities between acids, bases and salts. 3. **Explain** the basic principles of atomic and electronic theory. 4. **Know** the theoretical background that governs molecules and the creation of molecular bonds. 5. **Understand** the periodicity of the chemical properties of the elements as well as its effects on the chemical behaviour of the compounds of the elements in the periodic table. 6. **List** the main characteristics of the carbon atom. 7. **Know** the theoretical basis of the creation of organic compounds and the rules of the nomenclature of organic compounds 8. **Understand** and **explain** the chemical basis of hydrocarbons, alcohols, ethers, aldehydes, ketones, amines, organic acids and aromatic compounds. **Skills** 9. **Analyse** the main properties and characteristics of solutions, saturated and unsaturated hydrocarbons. 10. **Perform** basic exercises in general and inorganic chemistry, such as pH determination, oxidation/reduction, electrical conductivity, solubility, spectroscopy, etc., **demonstrating** cognitive abilities in terms of related concepts, techniques and applications. **Competences** 11. **Apply** the theoretical background that governs molecules and the creation of molecular bonds. 12. **Apply** the rules of the nomenclature of organic compounds. 13. Be able to **combine** the knowledge and skills acquired in this course with those presented in the following courses and **appreciate** the importance and the relationship it has with pharmaceutical science and the profession of Medical Representative.				
Prerequisites		**Required:**	-		
Course Content	• **Introduction to Chemistry**: Chemical elements and chemical compounds – Definition. What characterizes the mixtures.				

	• **Atom and its structure**. Atomic theories. Electron structure of atoms. Valence of the elements. Isotopic elements. Atomic mass. • **Molecules – Molecular Bonds.** The concept of the molecule. Covalent bond. Double and triple bond. Gram molecule and gram molecular volume. Heteropolar or ionic bond. Van der Waals forces. Hydrogen Bond. • **Periodic Table:** Structure of the periodic table and position of the elements in the periodic table. Grouping of data and analysis of their main physical and chemical properties by groups. • **Solutions - general concepts:** The meaning and characteristics of the solution. Solubility and gas solutions in liquids. Colloidal solutions and suspensions. • **Water, its importance to human**: Basics for water. Natural waters. Hard and soft water. Softening of water Chlorination of water. Sterilization of water. Water as a solvent. • **Acids - Bases – Salts:** Basics for acids, species and name. Electrolytic indicators. Acidity - The definition of pH – Indicators. In general, the bases. electrolytic dimension - Basics for salts. Acid-base balance in the body. Regulatory systems. • **Chemical reactions:** Classification, species, chemical equilibrium. Chemical kinetics. Oxidation and reduction. • **Organic compounds**: Basics for organic compounds. Establishment of organic compounds. Classification of organic compounds. Bonds. Isomerism. General principles of nomenclature. • **Saturated and Unsaturated Hydrocarbons:** Basics for hydrocarbons. Isomerization of saturated hydrocarbons. General properties of alkanes, alkenes and alkynes, unsaturated hydrocarbons, ethylene, acetylene. • **Alcohols**: Basics for alcohols and alcoholic properties. • **Ethers-Aldehydes-Ketones-Amines:** Basics for ethers and for carbonyl compounds. Formaldehyde. Acetaldehyde – Acetone. Basics for amines • **Organic acids**: General characteristics of organic acids. Acetic acid and other biologically interesting acids. • **Aromatic compounds**: Basics for aromatic compounds. Benzene and derivatives. Phenol and derivatives. Aromatic amines, Aromatic acids. • **<u>Laboratory Exercises:</u>** 1. Introduction, Laboratory Safety Discussion. Use of basic laboratory equipment. 2. Equilibrium in the dimension of weak electrolytes. Measurement of the pH of aqueous solutions. Determination of the pH of the above aqueous solutions using a pH meter and a pH paper. 3. Preparation of solutions of known concentrations. 4. Preparation of colloidal solutions and their properties
Teaching Methodology	The course content will be taught through: Power Point presentations, guided discussions with the active participation of students, individual and team work by students and the use of a variety of audiovisual media and other teaching tools as required for the delivery of each module. The lectures are accompanied by various laboratory exercises, carried out in the Chemistry Laboratory of the college.
Bibliography	***Greek Bibliography***

	• Μανουσάκης, Γ. (2016). *Γενική και Ανόργανη Χημεία*. Εκδόσεις Κυριακίδη. ISBN: 9789605990091 • Θεοχάρους, Σ. (2014). *Ανόργανη χημεία*: KES College, Λευκωσία. • Ebbing, D. D., and Gammon, S. D. (2014). *Σύγχρονη Γενική Χημεία: αρχές και εφαρμογές*. 10η Έκδοση. Εκδόσεις Τραυλός, ISBN 978-618-5061-02-9. • Lerou, G. W., and Simek, J. W. (2018). *Οργανική Χημεία*. 9η Έκδοση. Τζιόλα. ISBN: 978-960-418-804-8 • Clayden, J., Greeves, N., and Warren, S. (2017). *Οργανική Χημεία*. 1ος Τόμος. Utopia. ISBN: 978-618-5173-20-3 • Huheey, James (2012), Ανόργανη χημεία: Αρχές δομής και δραστικότητα, Εκδόσεις Ίων, ISBN: 9789603193081. • Λαλία- Καντούρη, Μαρία (2014), Γενική και ανόργανη χημεία: Αρχές & εργαστηριακές ασκήσεις, Εκδόσεις Ζήτη, ISBN: 9789604563357. • Μανουσάκης, Γεώργιος (2016), Γενική και ανόργανη χημεία, Εκδόσεις Κυριακίδη, ISBN: 9789605990091. • Wade, L. G. (2018). *Οργανική χημεία*. Τζιόλα, ISBN 978-960-418-804-8. • McMurry, J. (2015). *Οργανική Χημεία*. Πανεπιστημιακές Εκδόσεις Κρήτης, ISBN: 978-960-524-054-7. ***English Bibliography*** • Timberlake, K. (2015). *Chemistry: an introduction to general, organic and biological chemistry*. Global Edition. 12th Edition, Pearson, ISBN: 978-1292061320. • Patrick, G. (2017). *Organic chemistry*. Oxford Univercity press, ISBN: 9780198759775. • McIntosh, J. M. (2018). *Organic Chemistry: Fundamentals and Concepts.* Berlin: De Gruyter. ISBN: 9783110565126. **EBSCOHost** • McMurry, J. (2010). *Fundamentals of general, organic, and biological chemistry*. Pearson Prentice Hall, Upper Saddle River, NJ, ISBN: 978-0-13-815228-4. • Crichton, R. (2012). Biological Inorganic Chemistry: A New Introduction to Molecular Structure and Function. 2nd Edition. Amsterdam: Elsevier. ISBN:9780444537829. **EBSCOHost**.
Assessment	• Attendance and participation: 10% • Assignments / Essays: 10% • Laboratory Exercises 10% • Midterm Written Examination: 20% • Final Written Examination: 50%
	Written examination has two parts that are examined as part of one exam paper. The first part includes closed-ended questions, such as multiple choice questions, true or false, matching exercises, complete the gaps exercises, etc. The first part is usually worth 40% - 50% of the total marks of the exam paper. The second part includes open-ended questions that are meant to assess the students' abilities to analyse, reflect, explain, recall etc. The second part is usually worth 50% - 60%. The total marks of the exam paper are 100.
Language	Greek or English