University of Nicosia, Cyprus

Course Code	**Course Title**	**ECTS Credits**
CHEM-105	General Chemistry	6
Department	**Semester**	**Prerequisites**
Life and Health Sciences	Fall, Spring	None
Type of Course	**Field**	**Language of Instruction**
Required	Chemistry	English/Greek
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	1st	Dr. Photos Hajigeorgiou
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Objectives of the Course:

The main objectives of the course are to:

- to give students an introduction to the basic principles of general chemistry,
- to assist in the development of strong problem-solving skills,
- to help cultivate critical thinking in the approach to learning, and
- to help in the acquisition of sound hands-on practical skills in the chemistry lab

Learning Outcomes:

After completion of the course students are expected to be able to:

1. Use the concept of significant figures in calculations, and in particular apply the rules of significant figures using laboratory measurements and in the analysis of experimental data
2. Explain atomic and molecular structure and discuss the arrangement of atoms or molecules in different forms of matter
3. Utilize qualitatively and quantitatively chemical equations for a variety of chemical reaction types
4. Explain and use the results of quantum mechanics for the electronic structure in atoms and discuss how electronic structure can be employed to explain the periodic trends of various properties
5. Discuss the basic principles of chemical bonding including the application of molecular orbitals in the description of covalent bonding
6. Predict the molecular geometry of polyatomic molecules and molecular ions from the Lewis structure, and demonstrate the application of hybrid orbitals in predicting molecular geometry

Course Contents:

1. Introduction: Matter and Measurement

2. Atoms, Molecules and Ions
3. Stoichiometry: Calculations with Chemical Formulas and Equations
4. Aqueous Reactions and Solution Stoichiometry
5. Electronic Structure of Atoms
6. Periodic Properties of Elements
7. Basic Concepts of Chemical Bonding
8. Molecular Geometry

Laboratory Experiments, Demonstrations and Workshops:

1. Laboratory Safety Demonstrations
2. Significant Figures – Making Measurements in the Chemistry Laboratory (Workshop)
3. Basic Laboratory Techniques
4. Graphs in Chemistry (Workshop)
5. Experimental Determination of Density
6. Double Displacement Reactions and Precipitates
7. Acid-Base Titrations (Workshop)
8. Determination of Citric Acid Concentration in Fruit Juices
9. Estimation of Vitamin C Content in Fruit Juices
10. Determination of Acetic Acid Concentration in Vinegar
11. Molecular Geometry (Workshop)

Learning Activities and Teaching Methods:

Lectures, Laboratory Practical Sessions, Workshops, and Assignments.

Assessment Methods:

Laboratory Practical Sessions, tests, final examination

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
T.L. Brown, H.E. Lemay, B.E. Bursten, C.J. Murphy	Chemistry The Central Science	Prentice Hall	2009 11th Edition	ISBN: 0-13-235848-4
P.G. Hajigeorgiou	CHEM-105 Laboratory Manual	University of Nicosia	2010	
P.G. Hajigeorgiou	CHEM-105 Lecture Notes	University of Nicosia	2010	

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
R.H. Petrucci, W.S. Harwood, and F.G.Herring	General Chemistry Principles and Modern Applications	Prentice Hall	2002 8th Edition	ISBN: 0-13-014329-4
J. Olmsted III, and G.M.	Chemistry The Molecular Science	WCB Publishers	1997 2nd	ISBN: 0-8151-8450-6

Williams			Edition	