UNIVERSITY of NICOSIA

University of Nicosia, Cyprus

Course Code	**Course Title**	**ECTS Credits**
CHEM-120	Environmental Chemistry	5
Department	**Semester**	**Prerequisites**
Life & Health Sciences	Fall, Spring	None
Type of Course	**Field**	**Language of Instruction**
Required	Chemistry	English
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	1st	Dr Angelos Dados
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 principles of general, physical, analytical and organic chemistry required to assist with understanding of the chemical processes important for the environment
- to develop understanding of the terrestrial atmosphere and the basic chemical reactions that lead to air pollution in the troposphere
- to develop understanding of the sources of water on earth, and to develop awareness of the chemical pollutants of terrestrial water
- to help in the acquisition of sound hands-on practical skills in the chemistry lab

The course consists of 3 hours of theory and 1 hour for lab per week.

Learning Outcomes:

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

1. Explain atomic and molecular structure and discuss the arrangement of atoms or molecules in different forms of matter
2. Utilize qualitatively and quantitatively chemical equations for a variety of chemical reaction types
3. List different types of organic compounds and their chemical reactions
4. Use the basic tools of analytical chemistry to evaluate pollution levels
5. Explain the importance of water in maintaining life on earth and the different means of water pollution in lakes, rivers, and oceans
6. Explain the structure of the terrestrial atmosphere and explain the principal means of pollution in the troposphere and the depletion of ozone in the stratosphere by halogenated compounds
7. Explain the principal means of soil pollution

Course Contents:

1. Measurements, Units and Conversions
2. Atomic Theory
3. Chemical Bonding
4. Chemical Equations
5. Methods of Chemical Analysis
6. Organic Functional Groups
7. The Terrestrial Atmosphere
8. Natural and Anthropogenic Air Pollution
9. Terrestrial Sources of Water
10. Water and Soil Pollution

Laboratory Experiments:

1. Laboratory Safety Demonstrations
2. Spectrophotometric Methods of Chemical Analysis
3. Volumetric Analysis: Acid-Base Reactions
4. pH and Buffers
5. Methods of Separation
6. Gravimetric Analysis of Seawater and Drinking Water
7. The Detection and Measurement of Benzene in Drinking Water
8. The Effects of Acid Rain on Structural Materials
9. Detection of Metal Ions by Flame Color
10. The Molecular Mass of Carbon Dioxide Gas

Learning Activities and Teaching Methods:

Lectures, Laboratory Practical Sessions, and Assignments.

Assessment Methods:

Laboratory practical reports, assignments, tests, final examination

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
J.E. Andrews, P. Brimblecombe, T.D. Jickells, P.S. Liss, B. Reid	An Introduction to Environmental Chemistry	Wiley-Blackwell	2003 2nd Edition	ISBN-10 0632059052 ISBN-13 978-06320590

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
J.E. McMurry, D.S. Balantine, C.A. Hoeger, V.e. Peterson, M.E. Castellion	Fundamentals of General, Organic, and Biological Chemistry	Prentice Hall	2012 6th Edition	ISBN-10: 0136054501 ISBN-13: 978-0136054504

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. Williams	Chemistry The Molecular Science	WCB Publishers	1997 2nd Edition	ISBN: 0-8151-8450-6
G.W. Vanloon, S.J. Duffy	Environmental Chemistry – a global perspective	OUP Oxford	2010 3rd Edition	ISBN-10 0199228868 ISBN-13 978-0199228867