



Philadelphia University
Faculty of Science
Department of Basic Sciences
Second semester, 2007/2008

Course Syllabus

Course Title: General Chemistry II	Course code: 212103
Course Level: 1	Course prerequisite (s) and/or corequisite (s): 212101
Lecture Time: 10:10-11:00	Credit hours: 3

Academic Staff

Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Dr. Safwan Obeidat	Assistant Prof.	Faculty of Science (1018)	10-11 S, Tu, Th 11:30-12:30 M, W	Sobidat@Philadelphia.edu.jo

Course module description:

Introduces the fundamental theories of chemistry, such as atomic structure, stoichiometry, chemical bonding, mole concept, periodic table, kinetic molecular theory, energy and equilibria, gas laws, liquids and solids, oxidation and reduction, solutions, acids and bases.

Course module objectives:

This module presents a basic introduction to chemical concepts and the development of stoichiometric principles .It also provides the student with a fundamental store of chemical information and an understanding of the need for theory, then the theme centers on the development of theoretical explanations of observed facts by introducing the student to the concept of electronic structure, and chemical bonding. Finally it focuses on the physical properties of substances

Course/ module components

- **Books (title , author (s), publisher, year of publication)**

Text book:

Title: General Chemistry, The essential concepts, 9th edition

Author : Raymond Chang

Publisher: Mc Graw Hill 2007

ISBN: 0-07-241067-1

- **Support material (s) (Handouts, models).**

Teaching methods:

Lectures, discussion groups, tutorials, problem solving, debates, etc.

Learning outcomes:

- Knowledge and understanding
 - Have an understanding of chemical calculations (aspects of stoichiometry using the mole unit).
 - Understand electronic structure of atoms and molecules including types of bonds in chemistry and the experimental facts behind that.
 - Understand that the behavior of a gas phase is controlled by its volume, pressure, temperature and number of moles (ideal gas law).
- Cognitive skills (thinking and analysis).
To identify and solve problems. work with given information and handle chemical calculations based on chemical equations. And ability to differentiate between acids and bases.
- Communication skills (personal and academic).
Encourage the students to be self starters (creativity, decisiveness, initiative) and to finish the chemical problems properly (flexibility, adaptability). Also to improve general performance of students through the interaction with each other in solving different chemical problems.
- Practical and subject specific skills (Transferable Skills).
Gaining knowledge and experience of working with relevant modern laboratory equipment.

Assessment instruments

- Short reports and/ or presentations, and/ or Short research projects
- Quizzes.
- Home works
- Final examination: 50 marks

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
First examination	25
Second examination	25
Final examination: 50 marks	50
Reports, research projects, Quizzes, Home works, Projects	00
Total	100

Documentation and academic honesty

- Documentation style (with illustrative examples)

APA Style.

Example: Natarajan, R., & Chaturvedi, R. (2003). *Geology of the Indian Ocean Floor*. Hartford, CT: Merganser University Press

- Protection by copyright
- Avoiding plagiarism.

Course/module academic calendar

Week	Basic and support material to be covered
(1)	Gases
(2)	Physical properties of solutions
(3)	Energy and energy changes thermochemistry
(4)	Hess's Law
(5)	Conservation of energy, Heats of reaction, Bond energies, Entropy and Spontaneity
(6) First examination	The 2nd law of thermodynamics, Free energy and useful work, Standard entropies and free energies and equilibrium.
(7)	Reaction rates, rate laws, concentration and time, half lives, and collision theory.
(8)	Reaction mechanisms, effective collisions, activation energies, catalysts
(9)	Equilibrium law, thermodynamics and chemical equilibrium, K_p & K_c heterogeneous equilibria
(10)	LeChatelier's principle, equilibrium calculations
(11) Second examination	K_w , solutions of strong acids and bases, pH, conjugate acid-base systems, equilibria of molecular acids & bases
(12)	Buffers, acid-base equilibria in salt solution, polyprotic acids & their salts solutions.
(13)	Acid-base titrations and indicators..Solubility product.
(14)	Common ion effect & solubility, separation of ions by selective precipitation
(15)	Complex ion equilibria , Complex ions & solubility,
(16) Final Examination	Electrolysis , Quantitative aspects of electrolysis ,Galvanic cells, Reduction potentials. Spontaneity

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references

Books

1. Title: General Chemistry
Author(s)/Editor(s): James E. Brady
Publisher: John Wiley & sons
ISBN: **0-471-62131-5**
2. Title: Chemistry, The Central Science, 9th Edition
Author(s): Brown, LeMay, and Bursten.
Publisher: Pearson Education
ISBN: **0-13-049140-3**

Websites

<http://101science.com/>