



Philadelphia University
Faculty of Science
Department of Basic Science
First semester, 2020/2021

Course syllabus

Course title: General Chemistry 2	Course code: 0212103
Course level: 2	Course prerequisite (s) and/or corequisite (s): pass general chemistry1 (0212101)
Lecture time: (Sun,Tue,Thu) 11:10- 12:00 Mon., Wed., (17:45 - 19:15)	Credit hours: 3

Academic Staff Specifics				
Name	Rank	Office number and location	Office hours	E-mail address
Khadeejah Al Abrouni	Lecturer	Science building 1019	9-10 am Sun., Tue., Thu.	kabrouni@philadelphia.edu.jo
		Nursing building 9212	11-12 pm Mon., Wed,	

Course description (According to the University Catalogue)

The courses introduce the fundamental theories of chemistry, molecular and intermolecular forces, liquids and solids, physical properties of solutions, kinetic chemistry, chemical equilibrium, acids and bases, acid equilibrium: solubility base and equilibrium, energy relations in chemical reactions. Thermochemistry (Thermodynamics).

Course objectives:

- Present a fundamental store a chemical information and understanding of the need for theory.
- Understand the theme centers on the development of theoretical explanations of observed facts.
- Understand the concept energy relationships in chemical reactions, intermolecular forces and physical properties of solutions.
- To give the students some ideas about kinetics, equilibrium and thermodynamic.

- **Text book/ books (title , author (s), publisher, year of publication)**
Title: General Chemistry, The Essential Concept, 6th edition
Author: Raymond Chang.
Publisher: McGraw Hill 2011
ISBN: 978-007-131368-1
- **Support material (s): -----**
- **Laboratory Handbook/ books (when applicable):**
Title: Featuring Experiments in General Chemistry Measure Net , 6th edition
Author: Bobby Stanton, Lin Zhu, Charles H. Atwood
Publisher: Brooks/Cole 2010
ISBN: 978-0-495-56179-8

- **Support material (s) (vcs, acs, etc). -----**
- **Study guide (s) (when applicable) -----**
- **Laboratory Handbook/ books (when applicable) -----**

Teaching methods(Lectures, discussion groups, problem solving, debates, etc)(online)

Learning outcomes:

Knowledge and understanding.

- Understanding of chemical calculation.
- Knowing the relationship in chemical reaction
- Knowing the forces in molecules

Cognitive skills (thinking and analysis).

- Asses information relevant to a question
- Analysis , evaluate and synthesize information
- Use critical thinking and logic in the solution problems
- Solve problems using basic mathematical skill

Communication skills (personal and academic).

- Express ideas through written communication by home works
- Improve general performance for student through the interaction with each other in solving chemical problems

Transferable Skills.

- To generalize the analytical and quantitative skills in this courses and advance courses
- Employ efficient method of analysis and to assess the result of calculation
- Respect roubles and regulation of institution
- Psychomotor Skills (When applicable)

Assessment instruments

- Exams (Midterm and Final Exams)
- Quizzes.
- Homework assignments

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
Midterm examination	30
Final examination: 50 marks	50
quizzes, homework	20
Total	100

Documentation and academic honesty

- Documentation style (with illustrative examples)

Submit your home work in sheet containing your name, number of the homework.(online)

- Protection by copyright

Student should realize that some published information or data are the property of their authors and they are not allowed to use it without asking permission from the originators.

- Avoiding plagiarism.

Plagiarism is the unauthorized use or close imitation of the language and thoughts of another author.

Students must pursue their studies

Course/ academic calendar

	Basic and support material to be covered	Homework/ reports and their due dates
(1),(2)	Chapter 12 Ch. 12 Intermolecular forces and liquids 12.1 The Kinetic Molecular Theory of Liquids and Solids 12.2 Intermolecular Forces 12.3 Properties of Liquids 12.6 Phase Changes 12.7 Phase Diagrames	
(3), (4)	Chapter 13 Physical properties of a solution 13.1 types of solution 13.2 a molecular view of the solution process	

	<p>13.2 A Molecular View of the Solution Process</p> <p>13.3 Concentration Units</p> <p>13.4 Effect of Temperature on Solubility</p> <p>13.6 Colligative Properties</p>	
(5),(6)	<p>Ch. 14 Chemical Kinetics</p> <p>14.1 The rate of a reaction</p> <p>14.2 The rate laws</p> <p>14.3 Relation between reactant concentrations and time</p> <p>14.4 Activation energy and temperature dependence of rate constants</p> <p>14.5 Reaction Mechanisms</p> <p>14.6 Catalysis</p>	
(6)	First exam	
(7),(8)	<p>Ch. 15 Chemical Equilibrium</p> <p>15.1 The Concept of equilibrium</p> <p>15.2 Ways of expressing equilibrium constants</p> <p>15.3 What does the equilibrium constant tell us</p> <p>15.4 Factors that affect chemical equilibrium</p>	
(9),(10)	<p>Chapter 17 Acid-Base Equilibria and Solubility Equilibria</p> <p>17.1 Homogeneous Versus Heterogeneous Solution Equilibria</p> <p>17.2 Buffer Solutions Preparing a Buffer Solution with a Specific pH</p> <p>17.3 A Closer Look at Acid-Base Titrations</p> <p>17.4 Acid-Base Indicators</p> <p>17.5 Solubility Equilibria Solubility Product. Molar Solubility and Solubility Predicting Precipitation Reactions</p> <p>17.6 The Common Ion Effect and Solubility</p> <p>17.7 Complex Ion Equilibria and Solubility</p> <p>17.8 Application of the Solubility Product Principle to Qualitative</p>	
	Second exam	

(11),(12)	Ch. 6 Energy Relationships in Chemical Reactions 6.1 The Nature of Energy and Types of Energy 6.2 Energy Changes in Chemical Reactions 6.3 Introduction to Thermodynamics The First Law of Thermodynamics. Work and Heat 6.4 Enthalpy of Chemical Reactions Enthalpy. Enthalpy of Reactions. Thermochemical Equations 6.5 Calorimetry Specific Heat and Heat Capacity. Constant-Volume Calorimetry. Constant-Pressure Calorimetry 6.6 Standard Enthalpy of Formation and Reaction The Direct Method. The Indirect Method	
(13),(14)	Chapter 18 Energy and Thermodynamics of chemical reactions 18.1 The Three Laws of Thermodynamics 18.2 Spontaneous Processes 18.3 Entropy 18.4 The Second Law of Thermodynamics 18.5 Gibbs Free Energy 18.6 Free Energy and Chemical Equilibrium 18.7 Thermodynamics in Living Systems	
(15)	Final exam	

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 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.

Other Education Resources

Books

Title: *Chemistry: The Molecular Nature of Matter and Change* , 5th edition

Author : **Martin Silberberg**

Publisher:Mc Graw Hill 2009

ISBN: 978-0-07-1283540**Journals**

Websites
