



Jordan University of Science and Technology
Faculty of Science & Arts
Chemistry Department

CHEM102 General Chemistry (2)

Summer Semester 2019-2020

Course Catalog

3 Credit Hours. This course aims to teach students the basic principles of general chemistry. The first part of the course will cover the fundamental aspects of thermochemistry the nature of energy, enthalpies and the laws of chemical thermodynamics. The second part will cover the properties of solutions, the chemical kinetics and the third part of the course will cover chemical equilibrium, acids base equilibria, additional aspects of aqueous equilibria and electrochemistry to familiarize the students the main concepts of advance course of general chemistry knowledge. The course will be frequently illustrated will examples linked to other scientific disciplines, in particular to the field of life material sciences.

Text Book

Title	CHEMISTRY the Central Science
Author(s)	Brown, LeMay, Bursten, Murphy, and Woodward
Edition	10th Edition
Short Name	Text Book
Other Information	

Instructor

Name	Prof. Ziyad Taha
Office Location	-
Office Hours	Sun : 09:00 - 10:00 Sun : 12:00 - 13:00 Mon : 09:00 - 10:00 Tue : 12:00 - 13:00 Wed : 09:00 - 10:00 Wed : 12:00 - 13:00
Email	tahaz33@just.edu.jo

Instructor

Name	Dr. Rateb Hina
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Instructor	
Name	Dr. Ahmad Gharaibeh
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Office Hours	Sun : 10:00 - 11:30 Mon : 10:00 - 11:30 Tue : 10:00 - 11:30 Wed : 10:00 - 11:30
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Class Schedule & Room
<p>Section 1: Lecture Time: Sun, Mon, Tue, Wed : 08:30 - 10:00 Room: منصة الكترونية</p> <p>Section 2: Lecture Time: Sun, Mon, Tue, Wed : 10:00 - 11:30 Room: منصة الكترونية</p> <p>Section 3: Lecture Time: Sun, Mon, Tue, Wed : 11:30 - 13:00 Room: منصة الكترونية</p> <p>Section 4: Lecture Time: Sun, Mon, Tue, Wed : 13:00 - 14:30 Room: منصة الكترونية</p> <p>Section 5: Lecture Time: Sun, Mon, Tue, Wed : 14:30 - 16:00 Room: منصة الكترونية</p>

Prerequisites		
Line Number	Course Name	Prerequisite Type
911010	CHEM101 General Chemistry (I)	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	Thermochemistry 5.1 The Nature of Energy 5.2 The First Law of Thermodynamics 5.3 Enthalpy 5.4 Enthalpies of Reaction 5.5 Calorimetry 5.6 Hess's Law 5.7 Enthalpies of Formation	Ch. 5 From Text Book

Weeks 3, 4	Chemical Thermodynamics 19.1 Spontaneous Processes 19.2 Entropy and The Second Law of Thermodynamics 19.3 The Molecular Interpretation of Entropy 19.4 Entropy Changes in Chemical Reactions 19.5 Gibbs Free Energy 19.6 Free Energy and Temperature 19.7 Free Energy and The Equilibrium Constant	19 From Text Book
Weeks 5, 6	Properties of Solutions 13.1 The Solution Process 13.2 Saturated Solutions and Solubility 13.3 Factors Affecting Solubility 13.4 Ways of Expressing Concentration 13.5 Colligative Properties	Ch. 13 From Text Book
Weeks 7, 8, 9	Chemical Kinetics 14.1 Factors That Affect Reaction Rates 14.2 Reaction Rates 14.3 The Rate Law: The Effect of Concentration on Rate 14.4 The Change of Concentration with Time 14.5 Temperature and Rate 14.6 Reaction Mechanisms 14.7 Catalysis	14 From Text Book
Weeks 9, 10, 11	Chemical Equilibrium 15.1 The Concept of Equilibrium 15.2 The Equilibrium Constant 15.3 Interpreting and Working with Equilibrium Constants 15.4 Heterogeneous Equilibria 15.5 Calculating Equilibrium Constants 15.6 Applications of Equilibrium Constants 15.7 Le Chatelier's Principle	Ch. 15 From Text Book
Weeks 11, 12, 13	Acids-Base Equilibria 16.1 Acids and Bases: A Brief Review 16.2 Bronsted-Lowry Acids and Bases 16.3 The Autoionization of Water 16.4 The pH Scale 16.5 Strong Acids and Bases 16.6 Weak Acids 16.7 Weak Bases 16.8 Relationship Between K_a and K_b 16.9 Acid-Base Properties of Salt Solutions 16.10 Acid-Base Behavior and Chemical Structure 16.11 Lewis Acids and Bases	Ch. 16 From Text Book
Week 13	Additional Aspects of Aqueous Equilibria 17.1 The Common-Ion Effect 17.2 Buffered Solutions	Ch. 17 From Text Book
Weeks 14, 15	Electrochemistry 20.1 Oxidation States and Oxidation-Reduction Reactions 20.2 Balancing Oxidation-Reduction Equation 20.3 Voltaic Cells 20.4 Cell EMF under Standard Conditions 20.5 Free Energy and Redox Reactions 20.6 Cell EMF under Nonstandard Conditions	Ch. 20 From Text Book

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand the physical concepts and reaction processes within chemical reactions [1a, 1e, 1h, 1k]	35%	
Understand the principles of solution and units of concentration [1a, 1e, 1k]	20%	
Understand the principle of reaction rates and the effect of different factors on reaction rate [1a, 1e, 1h, 1k]	20%	
Understand the principles of equilibria, buffer solutions and electrochemistry [1a, 1b, 1e, 1k]	25%	

Relationship to Program Student Outcomes (Out of 100%)										
a	b	c	d	e	f	g	h	i	j	k
26.67	6.25			26.67			13.75			26.67

Evaluation	
Assessment Tool	Weight

First	30%
second	30%
final	40%

Policy	
Make-Up Exams	Make-up exams will be offered for valid reasons only with consent of the Dean. Make-up exams may be different from regular exams in content and format.
Attendance	Lecture attendance is mandatory. Student is allowed maximally 20% absentia of the total module hours. More than this percentage, student with an excuse will be drawn from the module. Otherwise, student will be deprived from the module with zero mark assigned.

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