



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

CHEM108 General And Organic Chemistry

Summer Semester 2019-2020

Course Catalog

4 Credit Hours. course focuses on some concepts of general chemistry and the basic of organic chemistry. It starts with the general part covering: Units & Measurements, atomic structure and periodic properties, types of chemical reactions, mole & mass relationships in chemical reactions, chemical bonding, ionic and covalent compounds, solutions, and acids/bases. The second part of this course includes the basic principles of organic chemistry, such as structures of different functional groups, naming, physical properties, preparation and some basic reactions and mechanisms. The course also covers all kind of isomers and stereochemistry.

Text Book

Title	Fundamental of General, Organic and Biological Chemistry
Author(s)	J. McMurry
Edition	7th Edition
Short Name	1
Other Information	

Instructor

Name	Prof. Ahmad Al-Ajlouni
Office Location	N4L0
Office Hours	
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Class Schedule & Room

Section 1:
Lecture Time: Sun, Mon, Tue, Wed : 14:30 - 16:30
Room: منصة الكترونية

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Measurements and Units (3 hours) a) Physical Quantities: Units and Scientific Notation b) Measuring Mass, Length, and Volume c) Measurement and Significant Figures d) Rounding Off Numbers e) Unit Conversions f) Temperature units g) Density and Specific Gravity	From 1
Weeks 1, 2	Atoms and the Periodic Table (4 hours) a) Atomic Theory and the Structure of Atoms b) Elements and Atomic Number c) Isotopes and Atomic Weight d) The Periodic Table e) Some Characteristics of Different Groups f) Electronic Structure of Atoms g) Electron Configurations h) Electron Configurations and the Periodic Table i) Electron-Dot Symbols	From 1
Week 3	Ionic Compounds (3 hours) a) Ions and the Octet Rule b) Ions of Some Common Elements c) Periodic Properties and Ion Formation d) Naming of Ions e) Ionic Bonds and compounds f) Naming Ionic Compounds g) Some Properties of Ionic Compounds	From 1
Weeks 3, 4	Molecular Compounds and Covalent Bonding (4 hours) a) Covalent Bonds b) Covalent Bonds and the Periodic Table c) Multiple Covalent Bonds d) Coordinate Covalent Bonds e) Characteristics of Molecular Compounds f) Molecular Formulas and Lewis Structures g) Drawing Lewis Structures h) The Shapes of Molecules i) Polar Covalent Bonds and Electronegativity j) Polar Molecules	From 1
Week 5	Classification and Balancing of Chemical Reactions (3 hours) a) Balancing Chemical Equations b) Precipitation Reactions and Solubility Guidelines c) Acids, Bases, and Neutralization Reactions d) Redox Reactions e) Recognizing Redox Reactions f) Net Ionic Equations	From 1
Weeks 5, 6	Chemical Stoichiometry: Mole and Mass Relationships (3 hours) a) The Mole and Avogadro's Number b) Gram-Mole Conversions c) Mole Relationships and Chemical Equations d) Mass Relationships and Chemical Equations e) Limiting Reagent and Percent Yield	From 1
Weeks 6, 7	Solutions (3 hours) a) The Solution Process and Solubility b) Temperature and Pressure Effect on Solubility: Henry's Law c) Units of Concentration d) Dilution e) Ions in Solution: Electrolytes f) Properties of Solutions g) Osmosis and Osmotic Pressure	From 1
Weeks 7, 8	Acid and Base (4 hours) a) Acids & Bases Definitions b) Acid and Base Strength c) Acid Dissociation Constants d) Water as Both an Acid and a Base e) Measuring Acidity in an Aqueous Solution: f) Working with pH g) Acid and Base Equivalents h) Some Common Acid-Base Reactions i) Acidity and Basicity of Salt Solutions j) Buffer Solutions k) Titration	From 1
Weeks 8, 9	Introduction to Organic Chemistry: Alkanes (6 hours) a) The Nature of Organic Molecules b) Families of Organic Molecules: Functional Groups c) The Structure of Organic Molecules: Alkanes and Their Isomers d) Drawing Organic Structures e) The Shapes of Organic Molecules f) Naming Alkanes g) Properties of Alkanes h) Reactions of Alkanes i) Cycloalkanes: structure and na	From 1
Weeks 9, 10	Alkenes, Alkynes, and Aromatic Compounds (6 hours) a) Alkenes and Alkynes b) Naming Alkenes and Alkynes c) The Structure of Alkenes: Cis-Trans Isomerism d) Properties of Alkenes and Alkynes e) Types of Organic Reactions f) Addition Reactions of Alkenes g) Alkene Polymers h) Aromatic Compounds and the Structure of Benzene i) Naming Aromatic Compounds j) Reactions of Aromatic Compounds	From 1
Week 11	Stereoisomerism (4 hours) a) Chirality and Enantiomers. b) Stereogenic Centers; the Stereogenic Carbon Atom. c) Configuration and the R-S Convention. d) The E-Z Convention for cis-trans Isomers. e) Polarized Light and Optical Activity. f) Properties of Enantiomers g) Diastereomers and Meso compounds h) Stereochemistry and chemical reactions	From 1

Week 12	Some Compounds with Oxygen, Sulfur, or a Halogen (4 hours) a) Alcohols, Phenols, and Ethers b) Naming Alcohols c) Properties of Alcohols d) Reactions of Alcohols e) Phenols f) Acidity of Alcohols and Phenols g) Ethers h) Thiols and Disulfides i) Halogen-Containing Compounds	From 1
Week 13	Aldehydes and Ketones (4 hours) a) The Carbonyl Group b) Naming Simple Aldehydes and Ketones c) Properties of Aldehydes and Ketones d) Some Common Aldehydes and Ketones e) Oxidation of Aldehydes f) Reduction of Aldehydes and Ketones g) Addition of Alcohols: Hemiacetals and Acetals	From 1
Weeks 14, 15	Carboxylic Acids and their Derivatives (5 hours) a) Carboxylic Acids and Their Derivatives: Properties and Names b) Acidity of Carboxylic Acids c) Reactions of Carboxylic Acids: Ester and Amide Formation d) Hydrolysis of Esters and Amides e) Polyamides and Polyesters f) Phosphoric Acid Derivatives	From 1
Week 15	Amines (2 hours) a) Classifying Amines b) Naming and Drawing Amines c) Properties of Amines d) Heterocyclic Nitrogen Compounds e) Basicity of Amines f) Amine Salts	From 1

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Know the units of measurements, conversion of units and significant figures	5%	
Understand the atomic and electronic structures, and how elements are organized in the Periodic Table and their periodic properties	5%	
Understand the tendency of elements to gain, lose or share electrons, and the basic of bonding and forming ionic and covalent compounds	10%	
Become familiar with different type of chemical reactions, and perform calculations from balanced chemical reactions	5%	
Know the properties of solutions and their concentration units	5%	
Recognize acids and bases, and their properties and reactions	10%	
Understand the structures of different organic molecules, and able to recognize and draw structures	10%	
Able to name organic molecules	10%	
Know the physical properties of each functional groups	10%	
Get familiar with all kind of isomers and stereochemistry	10%	
Understand major reactions of functional groups including preparation reactions	15%	
Recognize the acidic/basic properties of some organic compounds	5%	

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

Evaluation	
Assessment Tool	Weight

Midterm exam	40%
Final Exam	60%

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