



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

CHEM222 Inorganic Chemistry (1)

Second Semester 2020-2021

**Course Catalog**

3 Credit Hours. This course presents a basic introduction to inorganic chemical concepts. It provides the student with a fundamental of inorganic chemical information. It will cover the bonding and structures of inorganic compounds. It will introduce the definitions of acids and bases. It will also deals with the chemistry of the main group elements. (reactions and chemical and physical properties)

**Text Book**

<b>Title</b>	Inorganic Chemistry
<b>Author(s)</b>	D. Shriver
<b>Edition</b>	5th Edition
<b>Short Name</b>	Text book
<b>Other Information</b>	

**Instructor**

Name	<b>Prof. Ahmad Al-Ajlouni</b>
Office Location	N4L0
Office Hours	
Email	aajlouni@just.edu.jo

**Class Schedule & Room**

**Section 1:**

Lecture Time: Mon, Wed : 10:00 - 11:30

Room: منصة الكترونية

**Section 2:**

Lecture Time: Sun, Tue : 13:30 - 15:00

Room: منصة الكترونية

**Prerequisites**

Line Number	Course Name	Prerequisite Type
911020	CHEM102 General Chemistry (2)	Prerequisite / Pass

**Tentative List of Topics Covered**

Weeks	Topic	References
Week 1	The wave function of hydrogen atom. Periodic table. Effective nuclear charge and the screening effect	<b>Chapter 1</b> From <b>Text book</b>
Week 2	Atomic size, electron affinity and electronegativity. Bonding models in inorganic chemistry. Ionic and covalent bonding	<b>Chapter 1</b> From <b>Text book</b>
Week 3	MO theory, homonuclear and heteronuclear diatomic compounds. Polyatomic compounds.	<b>chapter 2</b> From <b>Text book</b>
Week 4	Hybridization. VSEPR. Overlap of hybrid orbitals. Bond distance, bond angle and electronegativity	<b>chapter 5</b> From <b>Text book</b>
Week 5	Ionic solids. Lattice energy. Born-Haber cycle	<b>Chapter 6</b> From <b>Text book</b>
Week 6	Acids and bases: Bronsted-Lowry theory. Lewis Theory	<b>Chapter 7</b> From <b>Text book</b>
Week 7	The strength of acids and bases. Polyoxo compounds. Hydrogen: Properties of hydrogen	<b>Chapter 7</b> From <b>Text book</b>
Week 8	Hydrogen: Properties of hydrogen and some important reactions. The hydrogen bond. Binary hydrides	<b>Chapter 10</b> From <b>Text book</b>

Week 9	Main group elements: Occurance and properties. Important reactions. Binary compounds. Complex formation	<b>Chapter 11</b> From <b>Text book</b>
Week 10	The Boron group (group III): Chemistry of boron. Boron hydrides and oxides. Reactions of boron compounds.	<b>Chapter 12</b> From <b>Text book</b>
Week 11	Occurance and properties of group III elements. Oxides and halides. Elements hydrides	<b>Chapter 13</b> From <b>Text book</b>
Week 12	The Carbon group (group IV): Diamond and graphite. Carbon oxides Compounds with C-N and C-S bonds. Properties of group IV elements. Hydrides and chlorides. Oxygen compounds	<b>Chapter 14</b> From <b>Text book</b>
Week 13	The Nitrogen group (group V): nitrogen and its compounds (hydrides and oxides). Occurance of group V elements. Hydrides, halides and oxides. The oxo acids. Phosphorus-Nitrogen compounds	<b>Chapter 15</b> From <b>Text book</b>
Week 14	The Oxygen group (group VI): Chemistry of oxygen and its compounds. Occurrence and reactions of group VI elements. Oxygen versus sulfur chemistry.	<b>Chapter 17</b> From <b>Text book</b>
Week 15	GVII Halogens: Occurrence and physical properties, chemical behavior and trends down the group	<b>Chapter 18</b> From <b>Text book</b>

<b>Mapping of Course Outcomes to Program Student Outcomes</b>	<b>Course Outcome Weight (Out of 100%)</b>	<b>Assessment method</b>
Understand the atomic structure and electronic configuration of atoms, understand and apply bonding theories, analyze and predict the chemical properties and behavior of atoms and compounds, and expose students to common chemical reactions, such as redox and acid/ base reactions [1a, 1b, 1c, 1e]	30%	
Understand the nature and physical properties of metals of Group IA, IIA, IIIA elements: understand their chemical behavior and properties, preparation, reactions, structures of their compounds and their uses and applications in real life. [1a, 1b, 1c, 1e, 1k]	30%	
Understand the nature and physical properties of nonmetals of Groups IVA, VA, VIA, VIIA and VIII A elements, analyze their chemical behavior and properties based on group and period positions, explore their reactions and the structures of their compounds, and show their uses and applications in real life. [1a, 1b, 1c]	40%	

<b>Relationship to Program Student Outcomes (Out of 100%)</b>										
a	b	c	d	e	f	g	h	i	j	k
26.83	26.83	26.83		13.50						6

<b>Evaluation</b>
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Assessment Tool	Weight
Mid term	50%
final	50%

Date Printed: 2021-11-14