Jordan University of Science and Technology

Faculty of Science & Arts

Chemistry Department

CHEM321 Inorganic Chemistry (2) - JNQF Level: 7

First Semester 2023-2024

Course Catalog
3 Credit Hours. This course is designed to strengthen and broaden knowledge of inorganic compounds and chemical bonding encountered in introductory college chemistry courses. Topics covered include molecular structure, symmetry, inorganic stereochemistry and reactions mechanisms. It will introduce students to the field of point groups and their applications. Also, an introduction to transition metal coordination compounds and their reactions. The course will be frequently illustrated will examples linked to other scientific disciplines.
Teaching Method: On Campus

Text Book	
Title	Inorganic Chemistry
Author(s)	Weller, Overton, Rourke, Armstrong
Edition	7th Edition
Short Name	Text Book
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Reference	Inorganic Chemistry	Housecroft and Sharpe	4th Edition	

Instructor	
Name	**Prof. Ahmed Hijazi**
Office Location	N4 L0

Office Hours	Sun : 10:30 - 11:30 Sun : 12:30 - 13:30 Tue : 10:30 - 11:15 Tue : 14:30 - 15:00 Wed : 08:00 - 08:45 Thu : 10:30 - 11:30 Thu : 12:30 - 13:30
Email	akhijazi@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 11:30 - 12:30 Room: N1302

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
912220	CHEM222 Inorganic Chemistry (1)	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Revision: General introduction, shape of atomic orbitals, electronic configuration, atomic orbitals, and molecules.	**Ch. 1** From **Reference**
Week 2	Type of Ligands. Coordination compounds. Complex formation. Coordination numbers.	**Ch. 19** From **Reference**
Week 3	Coordination number, geometry. Colour of transition metal complexes as related to ground and excited states.	**Ch. 19** From **Reference**
Week 4	Valence bond theory, hybridization and geometry of complexes. Nomenclature.	**Ch. 20** From **Reference**
Week 5	Isomerism: Ionization isomers, hydration isomers, coordination isomers, linkage isomers, diastereoisomers, enantiomers.	**Ch. 19** From **Reference**
Week 6	Reactivity and mechanisms.	**Ch. 26** From **Reference**
Week 7	Transition metals coordination compounds: Crystal field theory, molecular orbital approach.	**Ch. 20** From **Reference**
Week 8	Magnetic properties, electronic absorptions.	**Ch. 20** From **Reference**
Weeks 9, 10	Symmetry and point groups.	**Ch. 3** From **Reference**
Weeks 11, 12	Ligand field theory: ligand field splitting. Russell Saunders term symbols. Spin-Orbit coupling and spin multiplicity	**Ch. 20** From **Reference**

Weeks 13, 14	Elements of the first transition series: General remarks, oxidation states, binary compounds: oxides and halides. Compounds.	**Ch. 21** From **Reference**
Week 15	Applications of transition metal coordination compounds.	**Ch. 25** From **Reference**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Have an understanding and analyzing of coordinated inorganic chemical compounds. [1a, 1b, 1e] [1L7K1, 1L7S1]	25%	exam1, exam2
Have an understanding of the reactivity and different mechanisms to examine coordinated compounds. [1e, 1i] [1L7K1, 1L7S1, 1L7S2]	15%	exam2, final
Understand symmetry operations and elements in order to investigate the point groups of different molecules and compounds. [1a, 1e] [1L7K1, 1L7C1]	10%	final
Understand the electronic, vibrational, and magnetic properties of transition metal complexes. [1a, 1b, 1k] [1L7K1]	30%	exam1, exam2, final
Demonstrate the properties of the transition metals and the reactions they undergo to create compounds and their applications. [1e, 1i] [1L7S1, 1L7S3, 1L7C2]	20%	final

Relationship to Program Student Outcomes (Out of 100%)										
a	b	c	d	e	f	g	h	i	j	k
23.33	18.33			30.83				17.5		10

Relationship to NQF Outcomes (Out of 100%)					
L7K1	L7S1	L7S2	L7S3	L7C1	L7C2
52.5	24.17	5	6.67	5	6.67

Evaluation	
Assessment Tool	**Weight**
exam1	30%
exam2	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 Policy	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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