

Course Syllabus

1	Course title	Inorganic Chemistry (2)	
2	Course number	0303321	
3	Credit hours	3(theory)	
	Contact hours (theory, practical)	3(theory)/week	
4	Prerequisites/corequisites	Inorganic Chemistry (1), 0303221	
5	Program title	B.Sc. Chemistry	
6	Program code	0303	
7	Awarding institution	University of Jordan	
8	School	Science	
9	Department	Chemistry	
10	Course level	Third Year	
11	Year of study and semester(s)	2023 second	
12	Other department(s) involved in teaching the course	None	
13	Main teaching language	English	
14	Delivery method	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	Online platforms(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....	
16	Issuing/Revision Date	20-08-2022 / 20-06-2023	

**17 Course Coordinator:**

Name: Dr. Hazem Amarne

Contact hours: 10:30-11:30 Sun-Tue-Thur

Office number: Chemistry Annex Rm. 417

Phone number: N/A

Email: h.amarne@ju.edu.jo

18 Other instructors:

Name:

Office number:

Phone number:

Email:

Contact hours:

Name:

Office number:

Phone number:

Email:

Contact hours:

19 Course Description:

Symmetry operations; Symmetry elements; Point groups; Introduction to character tables. Basic applications of symmetry: Chiral and polar molecules. d-Block Metal Chemistry: Ground state electronic configurations; Classification of ligands; Chelate effect; Characteristic properties; Electroneutrality principle; Coordination complexes: Werner's theory; Common ligands and Nomenclature; The Kepert model; Coordination numbers; Isomerism. Bonding in d-block metal complexes: Valence bond theory; Crystal field theory; Spectrochemical series; Crystal field stabilization energy; Molecular orbital theory; Effective atomic number; 18-electron rule; Ligand field theory; Microstates and term symbols; Electronic absorption and emission spectra; Nephelauxetic effect; Magnetic properties.

20 Course aims and outcomes:

A- Aims:

To learn in depth and to acquire knowledge related to the fundamentals of inorganic chemistry including:

Symmetry elements, operations, and point groups; d-block chemistry; Nomenclature; coordination chemistry, bonding theories, electronic spectra, and magnetic properties.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to:

1. Recognize symmetry elements and assign point groups of different geometries and predict properties of complexes based on symmetry.
2. Explain structure, bonding, and properties of d-block metal complexes based on Valence Bond Theory.
3. Explain structure, bonding, and properties of d-block metal complexes based on Crystal Field Theory.
4. Explain structure, bonding, and properties of d-block metal complexes based on Molecular Orbital Theory and Ligand Field Theory.

SLOs	SLO (1)	SLO (2)	SLO (3)	SLO (4)
SLOs of the course				
1	✓			
2	✓	✓		
3	✓	✓		
4	✓	✓		
5				
6				

21. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Symmetry operations and elements	1+2	H. Amarne	1	First exam	Housecroft Chapter 3

Point groups and character tables	3+4	H. Amarne	1	First exam	Housecroft Chapter 3
Chiral and polar molecules	5	H. Amarne	1	Second exam	Housecroft Chapter 3
Electronic configurations	6	H. Amarne	2	Second exam	Housecroft Chapter 19
Classification of ligands	6	H. Amarne	2	Second exam	Housecroft Chapter 19
Electroneutrality principle	7	H. Amarne	2	Second exam	Housecroft Chapter 19
Nomenclature	7	H. Amarne	2	Second exam	Housecroft Chapter 19
The Kepert model and Coordination numbers	8	H. Amarne	2	Second exam	Housecroft Chapter 19
Valence bond theory	8	H. Amarne	2	Second exam	Housecroft Chapter 20
Crystal field theory	9	H. Amarne	3	Second exam	Housecroft Chapter 20
Spectrochemical series	9	H. Amarne	3	Second exam	Housecroft Chapter 20
Molecular orbital theory	10	H. Amarne	4	Second exam	Housecroft Chapter 20
Microstates and term symbols	11	H. Amarne	4	Final exam	Housecroft Chapter 20
Ligand field theory	12	H. Amarne	4	Final exam	Housecroft Chapter 20
Electronic absorption	13	H. Amarne	4	Final exam	Housecroft Chapter 20
Magnetic properties	14	H. Amarne	4	Final exam	Housecroft Chapter 20

22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Quiz	20	As per Sec. 21 above	1	Week 6	none
Midterm Exam	30	As per Sec. 21 above	2+3	Week 12	none
Final Exam	50	As per Sec. 21 above	1+2+3+4	Week 16	none

23 Course Requirements

Laptop/pc/or mobile phone, internet, MS Teams account, and moodle account

24 Course Policies:

A- Attendance policies: All students are expected to follow the of attendance policies of the University of Jordan, absences exceeding 15% of total number of class meeting (6 hour classes) will result in F grade or course drop.



B- Absences from exams and handing in assignments on time: University rules and regulations regarding make-up exams.

C- Health and safety procedures: N/A

D- Honesty policy regarding cheating, plagiarism, misbehaviour: University rules and regulations.

E- Grading policy: University rules and regulations

F- Available university services that support achievement in the course: N/A

25 References:

A- Required book (s), assigned reading and audio-visuals:

1. Inorganic Chemistry, by Catherine E. Housecroft and Alan G. Sharpe, 4th edition, Pearson, 2012.

B- Recommended books, materials, and media:

1. Inorganic Chemistry, by Miessler, Fischer, and Tarr, 5th Edition, Pearson, 2014.
2. Inorganic Chemistry, by Shriver, Weller, Overton, Rourke, Armstrong, 6th Edition, Oxford University Press, 2014.

26 Additional information:

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Name of Course Coordinator: Dr. Hazem Amarne ----- Date: 20/06/2023	Signature: -----
Head of Curriculum Committee/Department: ----- -----	Signature: -----
Head of Department: ----- -----	Signature: -----
Head of Curriculum Committee/Faculty: ----- -----	Signature: -----
Dean: ----- -----	Signature: -----