جامعة الإسراء
ISRA UNIVERSITY

COURSE Syllabus
According to JNQF

Course Name: Inorganic Chemistry 3

Course Number: 11013224

General Course Information:

Course title	Inorganic Chemistry 3
Course number	11013224
Credit hours	3
Contact hours	Face-to-Face
Prerequisites/corequisites	1101222
Academic Program	Chemistry
Program code	01
Awarding institution	Isra university
Faculty	Science
Department	Chemistry
Level of course	Third-year
Academic year /semester	2022/2023 -First Semester
Awarded qualification	Bachelor
Other department(s) involved in teaching the course	-
Language of instruction	English
Date of production/revision	16/10/2022

Course Coordinator:

Coordinator's Name: Manal Alkhabbas
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Other Instructors:

Instructor's Name:
Office No.:
Office Phone:
Office Hours:
Email:

Course Description *(English/Arabic)*:

English	*Some aspects of molecular structure and bonding; chemistry of hydrogen; chemistry of the main group elements: groups: IA (alkali); IIA (alkaline earth); IIIA-VIA-VIA; VIIA (halogens); VIII (noble gases). Introduction to Lanthanides and Actinides*
Arabic	بعض جوانب أشكال الجزيئات والروابط، كيمياء الهيدروجين، كيمياء العناصر الممثلة: IA (القلويات)، IIA (القلويات الترابية)، IIIA ، IVA ، VIA VA ، VIIA (الهاوجينات)، VIIIA (الغازات النبيلة); مقدمة في اللانثانيددات والأكتيندات.

Text Book: ***Author(s), Title, Publisher, Edition, Year, Book website.***

Catherine E. Housecroft and Alan G Sharpe***, Inorganic Chemistry***, Pearson Prentice Hall, 4th Edition, 2012, https://www.amazon.com/Inorganic-Chemistry-4th-Catherine-Housecroft/dp/0273742752.

References: ***Author(s), Title, Publisher, Edition, Year, Book website.***

. Shriver, M. Weller, T. Overton, J. Rourke, F. Armstrong, ***Inorganic Chemistry***, Macmillan Education (W. H. Freeman), 6th edition, 2014, https://www.amazon.com/Inorganic-Chemistry-Duward-Shriver/dp/1429299061.

Course Educational Objectives (CEOs):

	By the end of this course, the student should be fully aware of:
1.	The main group elements in the periodic table.
2.	The physical properties of the main group elements and their compounds.
3.	The chemical properties of the main group elements through their reactions.
4.	The existence and preparation of most important compounds of the main group elements
5.	The electronic configuration of lanthanides and actinides, variation of atomic and ionic radii, ionization energy, and other properties.

Intended Learning Outcomes (ILO's):

1.	Intended Learning Outcomes (ILO's)	**Relationship to CEOs**	**Contribution to PLOs**
2. A	Knowledge and Understanding:		
3. A1	Describe the structures and bonding of the elements and compounds of main group elements and lanthanides and actinides.	4	b
4. A2	Describe the extraction and preparation of some important elements and compounds of main group elements.	1, 5	a,
5. B	Intellectual skills:		
6. B1	Write balanced chemical equations for different reactions of main group elements and their compounds.	2, 3	c
7. B2	Explain the properties of the elements and their compounds in terms of their models of bonding and intermolecular attraction	2, 3	d
8. C	Subject-specific skills:		
9. C1			
10. C2			

11. C3			
12. D	Transferable skills:		
13. D1			
14. D2			
15. D3			

Weekly Schedule *(please chose the type of teaching)*

✓ *(**3 hrs** Face – To - Face)*

☐ *(**2 hrs** Face – To - Face **+1 hr** Asynchronous)* **(Hybrid)**

☐ *(**3 hrs** Online)*

Week	First Hour (Face – To - Face)	Second Hour (Face – To - Face)	Third Hour (Face – To - Face)	Ach. ILOs	Ach. PLOs	Descriptors*
1	Introduction to course and review of the syllabus	Classification of state of matter	Primary bonding: ionic, covalent, metallic.	A 1	a, and b	K
2	Secondary bonding: dipole-dipole, induced dipole-induced dipole, London dispersion/ van der Waals,	Periodic Properties, Periodic Trends, and Classification of main group Compounds	Classification of Main Group Compounds	A1 A2	a, and b	K
3	Revision of Lewis Structures and VSEPR Theory	Hydrogen: Hydrogen, Isotopes of Hydrogen, Deuterated compounds	Hydrogen: Uses and application, Synthesis of hydrogen, Polar and non-polar E–H bonds	A 1 A2 B1 B2 B3	a, b, c, d	K, S
4	Hydrogen: Classifications of Hydrides	Group 1: Occurrence, Uses, Extraction, Physical properties	Group 1: Physical properties, atomic spectra, and flame tests	A 1 A2 B1 B2 B3	a, b, c, d	K, S
5	Group 1 (1A): Chemical Properties,	Group 1 (1A):: Chemical Properties, complexes	Discussion of Homework 1	A 1 A2 B1 B2 B3	a, b, c, d	K, S
6	Group 2 (2A): Occurrence, Uses, Extraction, Physical properties	Group 2 (2A): Physical properties, atomic spectra, and flame tests	Group 2 (2A): Chemical Properties Quiz 1	A 1 A2 B1 B2 B3	a, b, c, d	K, S

7	Group 2 (2A): Complex ions in aqueous solution, Complexes with ligands other than water	Discussion of Homework 2	Group 13 (3 A): Occurrence, Uses, Extraction, Physical properties	A 1 A2 B1 B2 B3	a, b, c, d	K, S
8	Group 13 (3 A): Reactivity	Group 13 (3 A): **Simple Hydrides** Halides and complex halides	Group 13 (3 A): Oxides, oxoacids, oxoanions and hydroxides Coordination complexes of the M3+ ions	A 1 A2 B1 B2 B3	a, b, c, d	K, S
9	Group 13 (3 A): Electron-deficient borane clusters: an introduction	Group 13 (3 A): Boron Nitrogen Heterocycles: Borazines 18. Discussion	Midterm Exam	A 1 A2 B1 B2 B3	a, b, c, d	K, S
10	Group 14 (4A) Introduction The inert pair effect Physical properties	Group 14 (4A) Allotropes of carbon	Group 14 (4A) Inorganic compounds of carbon Silicon and its compounds	A 1 A2 B1 B2 B3	a, b, c, d	K, S
11	Group 14 (4A) Semiconductors	Group 14 (4A) Germanium, tin and lead	Discussion of Homework 3	A 1 A2 B1 B2 B3	a, b, c, d	K, S
12	Group 15 (5A) Introduction Physical properties Nitrogen Phosphorus Arsenic, antimony and bismuth	Group 15 (5A) Hydrides Halides Oxides of nitrogen	Group 15 (5A) Nitric acid Phosphorus oxides and oxo acids	A 1 A2 B1 B2 B3	a, b, c, d	K, S
13	Group 16 (6A) Introduction Physical properties Oxygen Extraction of oxygen	Group 16 (6A) Ozone Sulfur Reactivity of sulfur Hydrides H_2O_2	Group 16 (6A) Oxides Oxoacids Sulfuric acid Sulfur–nitrogen compounds	A 1 A2 B1 B2 B3	a, b, c, d	K, S
14	Group 17 (7A) Introduction Physical properties	Group 17 (7A) Compounds of the halogens:	Group 17 (7A) Oxides Oxoacids	A 1 A2 B1 B2	a, b, c, d	K, S

	Extraction	Hydrides, hydro halic acids, Interhalogen compounds	Group 18 (8A)	B3		
15	Introduction to Lanthanides and Actinides. Electronic Configuration	Introduction to Lanthanides and Actinides.	Introduction to Lanthanides and Actinides.	A 1 A2 B1 B2 B3	a, b, c, d	K, S
16	Final Exam					

* **K: Knowledge, S: Skills, C: Competency**

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- (3 hrs Face – To - Face)
- Course Videos
- Discussion Forums
- Quizzes
- Presentation

Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **___%**
- Midterm **___%**
- Final Exam **___%**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required equipment:

- **PC / Laptop with webcam and mic**
- **Internet Connection**
- **Access to Online Compiles such as:**
  Access to the IU E-Learning Platform at: https://elearn.iu.edu.jo/

Assessment Tools implemented in the course:

- Final Exam
- Midterm Exam
- Presentation
- Quizzes
- Assignments

Program Learning Outcome (PLOs):

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the (_____) program will demonstrate		Bloom Taxonomy Levels*
a.	Describe the fundamental scientific principles and theories across the four subfields of chemistry (Organic, inorganic, analytical and physical).	
b.	Identify and confirm chemical compounds structures as well as determine chemical composition.	
c.	Establish and concludes mechanisms of physical and chemical processes in addition to the ability of mastering qualitative and quantitative determination.	
d.	Solve the scientific problems using different mechanisms and procedures based on critical thinking.	
e.	Conduct scientific experiments in chemistry.	
f.	Commitment and interest in lifelong learning, and collaborate effectively with other people in a team.	
g.	Prepare logical, organized and concise written reports, and oral and poster presentations that effectively communicate chemical content to other scientists.	
h.	Commitment to the ethical principles of chemical research.	
i.	Find information about chemistry through databases and information	
j.	Evaluation of calculations in chemistry experiments and information analysis using computer software.	
k.	Demonstrate safety laboratory techniques.	

***Bloom Taxonomy Levels**

Level #	1	2	3	4	5	6
Level Name	**Knowledge**	**Comprehension**	**Application**	**Analysis**	**Evaluation**	**Synthesis**

Responsible Persons and their Signatures:

Course Coordinator	**Manal Alkhabbas**	**Completed Date**	**16/10/2022**
		Signature	

Received by (Department Head)	**Manal Alkhabbas**	**Received Date**	**16/10/2022**
		Signature