جامعة المجمعة
Majmaah University

Course Specifications

Institution:	**Majmaah University college of education- Zulfi**
Academic Department :	**Department of chemistry**
Programme :	**Bachelor degree of chemistry**
Course :	**Inorganic chemistry (main group elements)**
Course Coordinator :	**Enas Aljohani**
Programme Coordinator :	**Dr.gehan alaemary**
Course Specification Approved Date :	**9/ 12 / 1435 H**

This form compatible with NCAAA 2013 Edition

A. Course Identification and General Information

1 - Course title : **Inorganic chemistry (main group elements)**	Course Code: **CHEM 122**
2. Credit hours : **(2)**	
3 - Program(s) in which the course is offered: **Bachelor degree of chemistry**	
4 – Course Language : **Arabic language**	
5 - Name of faculty member responsible for the course: **Enas Aljohani**	
6 - Level/year at which this course is offered : **(2) Level**	
7 - Pre-requisites for this course (if any) : • **General chemistry 1**	
8 - Co-requisites for this course (if any) : •	
9 - Location if not on main campus : **Majmaah University (college of education- Zulfi)**	

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	-	What percentage?	40 %
B - Blended (traditional and online)		What percentage?	
D - e-learning	-	What percentage?	60 %
E - Correspondence		What percentage?	
F - Other		What percentage?	

Comments :

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B Objectives

What is the main purpose for this course?

This course is aimed to give a solid foundation in the areas of Inorganic chemistry. It provides the students with a thorough understanding of the chemistry of s- and p-block elements and it provides a detailed examination of the structure and bonding in main group and solid state compounds, including valence bond and molecular orbital theory for describing electronic structures and Structures of simple solids, This course also describe chemistry and characterization of main group element compounds.

Briefly describe any plans for developing and improving the course that are being implemented : 1- Electronic materials and computer based programs have been utilized to support the lecture course material. 2-The course material was posted on the website that could be accessed by the students enrolled in the course

C. Course Description

1. Topics to be covered

List of Topics	No. of Weeks	Contact Hours
Electronic structure and Periodic Classification of Elements, Periodic properties of the elements, Sizes of atoms and ions, Ionization potential, Electro negativity, Electron affinity, Metallic properties.	3	6
Ionic and covalent bonding, The Nature of Solids, some of ionic compounds. lattice energy, calculation of lattice energy, some applications of lattice energies, Born-Haber cycle An introduction to covalent compounds, Valence bond theory, Valence bond theory of hydrogen molecule H_2, Hybridization of hydrogen molecule H_2 Molecular orbital (MO) theory, Molecular Orbital (MO) Theory of the H_2 molecule. Building Molecular Orbital Diagrams for Homonuclear and Heteronuclear diatomic molecules	5	10
Types of Solids , Band Theory, State that silicon and germanium are semiconductor materials ,	2	4
Hydrogen and its compounds, Physical and chemical properties of hydrogen.	4	8

Chemical properties of s and p block elements. Diagonal relationship Li and Mg. Chemical properties of Beryllium. The difference between Beryllium and Aluminum. Introduction to Electron-deficient compound. Chemistry of boron.		

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	.....	.....	.....	.....	**28**
Credit	**2**	.....	.....	.....	.....	**2**

3. Additional private study/learning hours expected for students per week.

2

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	By the end of this course the students will be able to: Show the main aspects of main group elements chemistry	Lectures Tutorial discussions	In class quizzes Major and final exams

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	Draw the key features of ionic and covalent compounds Make accurate statements about facts, concepts and relationships relating to the main group Chemistry Use knowledge of Inorganic Chemistry to explain observations and phenomena	Homework assignments	
1.2	Define ionization potential and electron affinity, Ionic - covalent bonds, ionic and covalent compounds, Electron - deficient compound, Electron affinity, lattice energy.		
1.3	Describe the position of an element in the periodic table by use of the atomic number.		
2.0	**Cognitive Skills**		
2.1	By the end of the course students should be able to: Use the knowledge of Inorganic Chemistry to solve problems Use knowledge and understanding of essential facts, concepts principles and theories relating to course problems Analyze novel problems and make Strategies for their solution Perform problems related to the course content	Homework assignments Problem solving in the tutorial	In class quizzes Major and final exams
2.2	Identify and locate s- p- block elements in the periodic table Classify the elements into s-, p-, d-, and f-block elements according to location in the periodic table State and give example of diagonal relationships in		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	the periodic table		
2.3	Explain the periodicity in electro negativity-electron affinity of the elements across the table Explain the periodicity in Ionization potential of the elements across the table Explain the hybridization of hydrogen molecule Explain the chemical and physical properties of s-p-block elements		
2.4	Describe the molecular orbital theory of covalent bonding Describe the chemistry of boron		
2.5	Compare between beryllium and aluminum		
2.6	List different types of solids List of chemical properties of beryllium		
3.0	**Interpersonal Skills & Responsibility**		
3.1	By the end of the course students should be able to: • Work in teams as well as independently • Taking responsibility for Learning. • To think and solve problems in cooperative work with others.	Encourage students to Make decisions about how they learn best Solving problems in groups during	Grading homework assignments

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	• Manage resources, time and other members of the group.	tutorial Group assignments	
4.0	**Communication, Information Technology, Numerical**		
4.1	By the end of the course students should have the ability to make effective use of computers in chemistry applications, including • Using a computer as a tool in writing, drawing chemical structures and data analysis to communicate scientific information • Use software and Surf internet for course contents. • Report writing	Incorporating the use and utilization of computer in the course requirements Encourage students to use online and library resources	Evaluating the written reports.
5.0	**Psychomotor**		
5.1	By the end of the course students should be able to: • Write the electron configuration for s- and p-block correctly. • Draw an electronic energy level diagram for the hydrogen H2 correctly.	Lectures Homework assignments	Grading homework assignments

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	Class activates (in class quizzes, and homework)	Weekly	10%
2	Major exams 1	7	15%
3	Major exam 2	12	15%
4	Final exam	17	60%

D. Student Academic Counseling and Support

Each group of students are assigned to a member of staff who will be available for help and academic guidance office hours at specific (1) h on daily basis

E-mail communication

E. Learning Resources

1. List Required Textbooks :

Main Group Chemistry (Khalifa Mohammed Ali Saleh)

2. List Essential References Materials :

- Chemistry: Principles and Reactions by William L. Masterton, Cecile N. Hurley, Hardcover: 756 pages, Publisher: Brooks Cole, 5 edition, 2003
- Chemistry, 7th edition , Chang, 2006

3. List Recommended Textbooks and Reference Material :

- Chemistry: Matter and Its Changes, James E. Brady, Fred Senese
- General Chemistry: Principles and Modern Applications. 8th Edition by: Petrucci, Harwood, Herring
- Chemistry, 5th edition by Mortimer

4. List Electronic Materials :

- Websites on the internet that are relevant to the topics of the course
- Course-Lectures as videos (e.g. on YouTube) from Top (high ranked) Universities such as Harvard, MIT, and Stanford

5. Other learning material :

Multi media associated with the text book and the relevant websites

F. Facilities Required

1. Accommodation

- Lecture room with at least 35 seats
- Projector - interactive whiteboard

2. Computing resources

Computer room containing at least 20 systems

3. Other resources

Availability of equipment relevant to the course material

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Course evaluation by student
- Students- faculty meetings

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- Peer consultation on teaching
- Departmental council discussions
- Discussions within the group of faculty teaching the course

3 Processes for Improvement of Teaching :

- Conducting workshops given by experts on the teaching and learning methodologies
- Periodical departmental revisions of its methods of teaching

4. Processes for Verifying Standards of Student Achievement

- Providing samples of all kind of assessment in the departmental course portfolio of each course
- Assigning group of faculty members teaching the same course to grade same questions for various students. Faculty from other institutions are invited to review the accuracy of the grading policy
- Conducting standard exams such as the American Chemical Society exams or others.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- The course material and learning outcomes are periodically reviewed and the changes to be taken are approved in the departmental and higher councils.
- The head of department and faculty take the responsibility of implementing the proposed changes.

Course Specification Approved
Department Official Meeting No (…..) Date … / …. / ….. *H*

Course's Coordinator

Name : Enas Aljohani

Signature : .....

Date : 9/ 12 / 1435 *H*

Department Head

Name : **Dr.gehan alaemary**

Signature : Gehan

Date : …./ … / …… *H*