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(transition 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 (transition elements)**	Course Code: **CHEM 322**
2. Credit hours : **(4)**	
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 : **(6) Level**	
7 - Pre-requisites for this course (if any) : • **CHEM 122**	
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 (transition metal) It provides the students with a thorough understanding of the chemistry of d- and f-block elements and covers the basic concepts in coordination chemistry this course also focuses on the chemistry of the fourteen elements after lanthanum, regarded as the lanthanides, and the fourteen elements after actinium known as the actinides Topics to be covered include the inner transition elements and their position in the periodic table; their extraction; methods of preparation and uses; oxidation States, chemical properties; color and spectra properties magnetic Properties, size contraction and a comparison of the two series.

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 only.

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• General features of transition metal chemistry. • Position in the periodic table and the importance of transition metals . • D- block elements properties and f- block elements properties. • The electronic structures of transition metals. • Variable oxidation state (number). • The formation of complex ions. • The formation of colored compounds. • Catalytic activity and magnetic properties of Transition metal compounds.	3	12

• First transition series 3d series • Chemistry of Yttrium and Scandium. • Properties of scandium and Yttrium compounds. • Chemistry of titanium – vanadium – chromium – magnesium – iron- cobalt – nickel – platinum- copper	3	12
• Crystal field theory • Valence bond theory	2	8
Chemistry of Lanthanides • position in periodic table • abundance, extraction and uses • oxidation states • chemical properties • magnetic properties • size contraction • Electronic absorption spectra • Separation of lanthanides	3	12
Chemistry of Actinides • position in periodic table • abundance, extraction and uses • oxidation states • chemical properties • magnetic properties • size contraction • Electronic absorption spectra • Separation of lanthanides	3	12

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	56					56
Credit	4					4

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

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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 the chemistry of Transition elements (d- block and f- block) • draw the key features of coordination compounds • Make accurate statements about facts, concepts and relationships relating to Inorganic chemistry • Use knowledge of Inorganic Chemistry to explain observations and phenomena	Lectures Tutorial discussions Homework assignments	In class quizzes Major and final exams
1.2	Define transition metal ions, paramagnetic elements, Lanthanides, Actinides.		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.3	Show the Position of d –f block elements in the periodic table.		
1.4	Name the elements of 3d series.		
1.5	Understand the differences and similarities of the two groups of inorganic elements.		
2.0	**Cognitive Skills**		
2.1	By the end of the course students should be able to: Use the knowledge of transition metal 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 d- f- block elements in the periodic table. Classify the elements into d and f-block elements according to location in the periodic table. List characteristic properties of transition elements. List the difference between d block elements and f block elements.		
2.3	Explain the existence of variable oxidation number in ions of transition elements		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	Explain the chemical and physical properties of d- f -block elements. Explain the crystal field theory.		
2.4	Distinguish between lanthanides and actinides.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	By the end of the course students should be able to: - Taking responsibility for Learning. - Work independently and as part of a team. - To think and solve problems in cooperative work with others. - Manage resources, time and other members of the group.	Encourage students to make decisions about how they learn best Solving problems in groups during tutorial Group assignments	Grading homework assignments
4.0	**Communication, Information Technology, Numerical**		
4.1	By the end of the course students should be able to: • Use software and Surf internet for course contents. • Use computational tools • 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:	Lectures	Grading homework

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	• Write the correct electron configuration for transition metal ions. • Draw crystal field d-orbital splitting diagram.	Homework assignments	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 :

- Inorganic Chemistry, Second Edition [James E. hehe]

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 : .....

Department Head

Name : **Dr.gehan alaemary**

Signature : **Gehan**

Date : 9/ 12 / 1435 *H* [***Date :*** …./ … / …… *H*