



**ATTACHMENT 2 (e)**

**Course Specifications**

**Kingdom of Saudi Arabia**

**The National Commission for Academic Accreditation & Assessment**

# **Chemistry of the Main Group Elements**

**4022141-2**  
**Course Specifications**  
**(CS)**





### Course Specifications

Institution: <b>Umm Al-qura University</b>	Date of Report: <b>2017</b>
College/Department : <b>Faculty of Applied Sciences/ Department of Chemistry</b>	

#### A. Course Identification and General Information

1. Course title and code: <b>Chemistry of the Main Group Elements / 4022141-2</b>	
2. Credit hours: <b>2 hours (theoretical)</b>	
3. Program(s) in which the course is offered. <b>Chemistry and Industrial Chemistry</b>	
4. Name of faculty member responsible for the course: <b>Dr. Mona Alhasani</b>	
5. Level/year at which this course is offered: <b>4<sup>th</sup> level/2<sup>nd</sup> year</b>	
6. Pre-requisites for this course (if any): <b>General Chemistry 2</b>	
7. Co-requisites for this course (if any): <b>-</b>	
8. Location if not on main campus: <b>both on El-Abedyah and El-Zaher</b>	
9. Mode of Instruction (mark all that apply)	
a. Traditional classroom	<input checked="" type="checkbox"/> What percentage? <b>100%</b>
b. Blended (traditional and online)	What percentage?
c. e-learning	<input type="checkbox"/> What percentage? <input type="checkbox"/>
d. Correspondence	<input type="checkbox"/> What percentage? <input type="checkbox"/>
f. Other	<input type="checkbox"/> What percentage? <input type="checkbox"/>
Comments:	



## B Objectives

<p>1. What is the main purpose for this course?</p> <p>By the end of this course, the student should fully aware of:</p> <p>a. The main group elements in the periodic table.</p> <p>b. The chemical properties of the main group elements through their reactions.</p> <p>c. The existence and most important compounds of the main group elements.</p>
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)</p> <ul style="list-style-type: none"> <li>• Encourage students to carry out reports in the field of chemistry of main group elements.</li> <li>• Using different learning sources of the course, so that the students make use of more than one reference.</li> <li>• The use of smart teaching halls for lectures.</li> </ul>

## C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
• General and periodic properties of main group (non-transition) elements; electronic structure, size, electron affinity, ionization, electronegativity & electropositivity and oxidation states.	2	4
• Horizontal, perpendicular and diagonal relationships in periodic table	1	2
• Hydrogen and its position & properties, its isotopes and chemical properties.	1	2
• s-block elements; electronic configuration, size, hardness, melting points – chemical properties; chemical reactivity with metals, nitrogen, acids, complexes formation – solubility and hydration – solubility in ammonia	3	6
• Halides – some chemical properties of lithium and magnesium; diagonal relationship between lithium and magnesium elements	1	2
• Chemical properties of beryllium and differences between it and second group elements – diagonal relationship between beryllium and aluminum.	1	2



<ul style="list-style-type: none"> <li>p-block elements; their electronic configuration, properties and their compounds – properties of the first element in each group and compare it with the last element – inert pair effect –metallic and non-metallic properties of groups.</li> </ul>	3	6
<ul style="list-style-type: none"> <li>Independent study of the third, fourth, fifth, sixth, seventh and inert gases groups.</li> </ul>	2	4

## II-General scheme for identification of organic aliphatic unknown

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. - Each student spends 2 hrs each week in preparing reports and their discussions.
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy.
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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	Know the general and periodic properties of main group (non-transition) elements including their atomic and ionic size, ionization potential, electron affinity, electro-negativity and physical properties.	<ul style="list-style-type: none"> <li>Lectures</li> <li>Scientific discussion</li> <li>Library visits</li> <li>Web-based study</li> </ul>	<ul style="list-style-type: none"> <li>Exams</li> <li>web-based student performance systems</li> <li>portfolios</li> </ul>
1.2	Recognize the horizontal, perpendicular and diagonal relationships in periodic table		
1.3	List the chemical properties of hydrogen and its isotopes.		
1.4	Define s-block elements and recognize their properties.		
1.5	Describe halides and state some chemical properties of lithium and magnesium and definition of the diagonal relationship between lithium and magnesium.		
1.6	Recall and describe the chemical properties of beryllium and recognize the differences between it and second group		



	elements		
1.7	Define the p-block elements and recognize their properties.		
1.8	Remember the third, fourth, fifth, sixth, seventh and inert gases groups.		
<b>2.0</b>	<b>Cognitive Skills</b>		
2.1	Summarize the general and periodic properties of main group (non-transition) elements including their atomic and ionic size, ionization potential, electron affinity, electronegativity and physical properties.	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Scientific discussion</li> <li>• Library visits</li> <li>• Web-based study</li> </ul>	<ul style="list-style-type: none"> <li>• Periodic and final exams.</li> <li>• Web-based student performance systems.</li> <li>• Reports.</li> </ul>
2.2	Compare between the horizontal, perpendicular and diagonal relationships in periodic table		
2.3	Interpret the chemical properties of s-block elements.		
2.4	Evaluate the diagonal relationship between lithium and magnesium.		
2.5	Compare between beryllium and second group elements		
2.6	Define the chemical properties of p-block elements.		
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1			
3.2			
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
	<ul style="list-style-type: none"> <li>• Evaluate the general properties of the periodic table</li> <li>• Interpret the chemical and physical properties of the groups of s and p-blocks.</li> <li>• Use information and communication technology.</li> <li>• The ability to use e-mail to communicate with the instructor and other students.</li> <li>• Scientific writing.</li> <li>• Use his/her observations to solve problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Scientific discussion</li> <li>• Library visits</li> <li>• Web-based study</li> </ul>	<ul style="list-style-type: none"> <li>• web-based student performance systems</li> <li>• individual and group presentations</li> </ul>
<b>5.0</b>	<b>Psychomotor</b>		
5.1	NOT APPLICABLE		
5.2			

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

Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
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1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam. (2 hours exam)	16	50 %
5	<b>Total</b>	<b>100 %</b>	

#### D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Office hours: During the working hours weekly.
- Academic advising for students.
- Availability of staff members to provide counselling and advice.

#### E. Learning Resources

1. List Required Textbooks
<ul style="list-style-type: none"> <li>• A. G. Massey, Main Group Chemistry, 2nd Edition, Wiley, 2000.</li> </ul>
2. List Essential References Materials (Journals, Reports, etc.)
<ul style="list-style-type: none"> <li>• Das, Kumar V.G, Main Group Elements and their Compounds, Springer, 1996.</li> </ul>
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
<ul style="list-style-type: none"> <li>• F. A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, A comprehensive text, 1988, John Wiley &amp; Sons.</li> </ul>
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
<ul style="list-style-type: none"> <li>• <a href="http://www.chemweb.com">http://www.chemweb.com</a></li> <li>• <a href="http://www.sciencedirect.com">http://www.sciencedirect.com</a></li> <li>• <a href="http://www.rsc.org">http://www.rsc.org</a></li> </ul>
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

#### F. Facilities Required



Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Rooms equipped with computers and projectors.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

#### G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaire evaluation of the course in particular.

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

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Application of e-learning.
- Exchange of experiences internal and external.
- Review of strategies proposed.
- Providing new tools for learning.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)


- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

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



- Periodic Review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.

**Faculty or Teaching Staff: Dr. Mona Alhasani**

**Signature:** 

**Date Report Completed: 12/1/2019**

**Received by: Dr. Ismail Althagafi Department Head**

**Signature:** 

**Date: 20/1/2019**

