



# Course Specifications

Institution:	Majmaah University college of education- Zulfi
Academic Department :	Department of chemistry
Programme :	Chemistry
Course :	General Chemistry (1) physical
Course Coordinator :	<b>Ibtehag ELhassan</b>
Programme Coordinator :	<b>Dr.Gehan Laaemary</b>
Course Specification Approved Date :	28/ 12 / 1436 H□



## A. Course Identification and General Information

1 - Course title : <b>General chemistry (1) physical</b>	Course Code: <b>CHEM 111</b>
2. Credit hours : ( 2 )	
3 - Program(s) in which the course is offered: <b>Bachelor degree of chemistry</b>	
4 – Course Language : <b>Arabic language</b>	
5 - Name of faculty member responsible for the course: <b>Ibtehag ELhassan</b>	
6 - Level/year at which this course is offered : (1) Level	
7 - Pre-requisites for this course (if any) :---	
8 - Co-requisites for this course (if any) : • <b>General chemistry ( 1 ) laboratory</b>	
9 - Location if not on main campus :  <b>Majmaah University ( college of education- Zulfi )</b> <input type="checkbox"/>	
10 - Mode of Instruction (mark all that apply) <input type="checkbox"/>	
A - Traditional classroom <input type="checkbox"/>	<input type="checkbox"/> What percentage? <input type="checkbox"/> <b>30 %</b> <input type="checkbox"/>
B - Blended (traditional and online) <input type="checkbox"/>	<input type="checkbox"/> What percentage? <input type="checkbox"/>
D - e-learning <input type="checkbox"/>	<input type="checkbox"/> What percentage? <input type="checkbox"/> <b>70 %</b> <input type="checkbox"/>
E - Correspondence <input type="checkbox"/>	<input type="checkbox"/> What percentage? <input type="checkbox"/>
F - Other <input type="checkbox"/>	<input type="checkbox"/> What percentage? <input type="checkbox"/>
Comments : ..... <input type="checkbox"/>	

## B Objectives

What is the main purpose for this course?

This course is aimed to give basic concepts of physical chemistry. Recognize the fundamental information about the gaseous state of matter. Familiarize intermolecular forces, liquid and solid states. Know the elementary thermodynamics and thermo chemistry and their applications. Enable the students to have an idea about types of solutions, concentration units, adsorption, fractional and steam distillations, effects of temperature and pressure on solubility.



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
<ul style="list-style-type: none"> <li>Units of measurement</li> </ul> <p><i>Gaseous State:</i></p> <ul style="list-style-type: none"> <li>Boyle's law</li> <li>Charles's law and Kelvin scale of temperature</li> <li>Application of Charles's law and Boyle's law</li> <li>Combined gas law, ideal gas equation and universal gas constant</li> <li>Dalton's law of partial pressure</li> <li>Mathematical derivation of Dalton's law and their applications</li> <li>Graham's law of diffusion and its applications</li> <li>Kinetic model of gas and its postulates</li> </ul>	3	3
<p><i>Liquid State:</i></p> <ul style="list-style-type: none"> <li>Physical properties of liquid</li> <li>Evaporation and condensation</li> <li>Vapour pressure of liquid and boiling</li> <li>Surface tension</li> <li>Viscosity</li> <li>Maxwell-Boltzmann distribution</li> <li>boiling point</li> <li>Latent heat of vaporization</li> <li>freezing point</li> </ul>	3	3
<p><i>Solid State:</i></p>	2	2

<ul style="list-style-type: none"> <li>Physical properties of solid</li> <li>Crystalline and amorphous solids</li> <li>Types of crystal system</li> </ul>		
<p>Modes of expressing concentration of solution:</p> <ul style="list-style-type: none"> <li>Condensation and solubility</li> <li>Mass-mass relationship</li> <li>Mass- volume relationship</li> </ul>	3	3
<p>Chemical equilibrium</p> <ul style="list-style-type: none"> <li>Reversible and irreversible reactions</li> <li>Law of mass action</li> <li>Equilibrium constant (<math>K_c</math>) and its characteristics</li> <li>Homogenous and heterogeneous equilibrium</li> <li>Le-chatelier's principle and its application</li> </ul>	3	3
<p>General chemistry (1) laboratory.</p> <p>Laboratory safety rules - detection of Acid and basic radicals of simple salt</p>	14	28

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

<input type="checkbox"/>	Lecture	Tutorial	Laboratory	Practical	Other:	Total
<b>Contact Hours</b>	14		28		<input type="checkbox"/>	42
<b>Credit</b>	2		<input type="checkbox"/>	<input type="checkbox"/>		2

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## 3. Additional private study/learning hours expected for

2



students per week.



#### 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
<b>1.0</b>	<b>Knowledge</b>		
<b>1.1</b>	By the end of this course the students will be able to: <ul style="list-style-type: none"> <li>Define the basic concepts of physical chemistry.</li> <li>Define Vapour pressure of liquid and boiling Surface tension Viscosity, boiling point, Latent heat of vaporization, freezing point</li> <li>Understand the main theories and laws of thermo chemistry, gases and equilibrium</li> </ul>	Lectures  Tutorial discussions  Homework assignments  Laboratory work and assignment.	In class quizzes  Major and final exams  lab practical exam
<b>2.0</b>	<b>Cognitive Skills</b>		
<b>2.1</b>	By the end of the course students should be able to: <ul style="list-style-type: none"> <li>Use the knowledge of physical chemistry to solve problems</li> <li>Use knowledge and understanding of essential facts, concepts principles and theories relating to course problems</li> <li>Analyze novel problems and make Strategies for their solution</li> <li>Perform problems related to the course content</li> </ul>	Homework assignments  Problem solving in the tutorial	In class quizzes  Major and final exams
<b>2.2</b>	List different types of solids		
<b>2.3</b>	Implement Le-Chatelier principle		
<b>2.4</b>	Describe chemical equilibrium, and perform calculations on the equilibria (acid / base equilibria)		
<b>2.5</b>	Explain the basics of the kinetic theory of gases		



	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
2.6	Recognize and describe the use of laboratory equipment, such as burettes, pipettes and flasks.		
3.0	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	<p>By the end of the course students should be able to:</p> <ul style="list-style-type: none"> <li>• work in teams as well as independently</li> <li>• Taking responsibility for Learning.</li> <li>• To think and solve problems in cooperative work with others.</li> <li>• Manage resources, time and other members of the group.</li> </ul>	<p>Encourage students to make decisions about how they learn best</p> <p>Solving problems in groups during tutorial</p> <p>Group assignments</p>	Grading homework assignments
4.0	<b>Communication, Information Technology, Numerical</b>		
4.1	<p>By the end of the course students should have the ability to make effective use of computers in chemistry applications, including:</p> <ul style="list-style-type: none"> <li>• Using a computer as a tool in writing, drawing chemical structures and data analysis to communicate scientific information</li> <li>• Use software and Surf internet for course contents.</li> <li>• Report writing</li> </ul>	<p>Incorporating the use and utilization of computer in the course requirements</p> <p>Encourage students to use online and library resources</p>	Evaluating the written reports
5.0	<b>Psychomotor</b>		
5.1			





	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods

## 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	Med- term exam	7	20%
3	lab practical exam	8	10%
4	Final lab exam	15	20%
5	Final exam	17	40%

## 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 :

- General chemistry (alkimya'a ala'amah by Adel Ahmed )



### 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, 7<sup>th</sup> 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, 5<sup>th</sup> 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**

- Chemical laboratory
- 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 ( 3 ) Date **28 / 12 / 1436 H**

**Course's Coordinator** ☐

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**Department Head** ☐

**Name :** ☐ **Ibtehag ELhassan** ☐

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**Name :** ☐ Geham Alomayri ☐

**Signature :** ☐ .....

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**Signature :** ☐ .....

**Date :** ☐ 28 / 12 / 1436 H ☐

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