KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

General Chemistry I			
Course Title	General Chemistry I and Lab		
Course Code	CHM1410C	**No. of Credits**	4
Department	All Departments	**College**	Science and Engineering
Pre-requisites Course Code	TLS0305	**Co-requisites Course Code**	
Course Coordinator(s)	Ms. Mariam Y. Merry		
Email	mariam.yacoub@komar.edu.iq	**IP No.**	
Other Course Teacher(s)/Tutor(s)	none		
Learning Hours	**For the Lecture time** Section 1: Sunday/Wednesday – 4:00-5:30 p.m class 113 Section 2: Monday/Thursday – 10:00 – 11:30 a.m. class 113 Section 3: Monday/Wednesday – 8:00 – 9:30 a.m. 113 **For the Lab time** Section 1: Thursday – 3:00-6:00 p.m. outside the building Section 2: Thursday – 12:00-3:00 p.m. outside the building Section 3: Sunday – 9:00-12:00 a.m. outside the building		
Contact Hours	Every Tuesday 2:00 – 4:00 p.m. or by making an appointment via email Office location is in the second floor-Room 234		
Course Type	College Requirement		
Offer in Academic Year	**Spring 2016**		

COURSE DESCRIPTION

This course is intended to provide students with a fundamental knowledge of the modern theory in general and inorganic chemistry. It covers basic background of many topics that would be addressed, in more detail, in General chemistry II or any advance course and also covers many important topics such as matter and energy; measurements and units; stoichiometry; chemical reaction; physical and chemical properties; gas laws; periodicity of elements; molecular structure and geometry; chemical bonding and thermo-chemistry.

COURSE OBJECTIVES

By the end of the course students should have a working knowledge of the concepts covered in each chapter, including an ability to be aware about chemical formulas and chemical equations for some chemical reactions, also emphasis on developing problem-solving skills as well as on concepts and theories. The course also covers topics that are essential background material to many disciplines in science and technology

COURSE LEARNING OUTCOMES

1. **Knowing/Remembering:** Students should be able to
   a) Define methods for calculating amounts of the energy and know the relationship between energy, work and heat.
   b) Find problems involving the quantities of compound produced or consumed in a chemical reaction.
   c) Identify the relationships among pressure, temperature, volume, and he amount of the gas and identify the behavior of gases using the ideal gas law.
   d) Recognize the organization of the periodic table and the ionization energy, electron affinities and electronegativity with the chemistry of elements and recognize the periodic trends of elements. (E)
2. **Comprehension/Understanding:** Students should be able to
   e) Classify matter as substances, elements, compounds, heterogeneous mixture and homogeneous mixture.
   f) Describe the molecular structure, geometry, and polarity of given molecules. (E)
3. **Applications:** Students should be able to
   g) Determine the empirical and molecular formula of a compound by mass and the concentration, density, and the molecular weight of molecules
   h) Determine a chemical reaction by predicting the products of a the reaction (E)
4. **Conduct experiments:**
   i) Students should be able to set and conduct experiments that linked to the Learning Outcomes. (E, F)

GUIDELINES ON GRADING POLICY

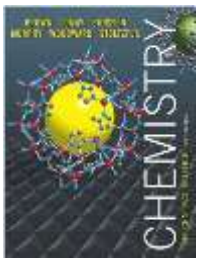
Points	*Percentage Scores*	*Grade*
A	*95–100*	*4.0*
A-	*90-94*	*3.7*
B+	*87–89*	*3.3*
B	*83-86*	*3.0*
B-	*80-82*	*2.7*
C+	*75–79*	*2.3*
C	*70-74*	*2.0*
C-	*65-69*	*1.7*
D+	*60–64*	*1.3*
D	*55-59*	*1.0*
D-	*50-54*	*0.7*
F	*0–49*	*0*
I	*Incomplete Course Work*	
W	*Official Withdrawal*	

COURSE TEACHING AND LEARNING ACTIVITIES
This course will be carried out in 3 hrs theoretical and 3 hrs experimental per week. The semester has 15-instructional weeks followed by one week of final exam. Course instructor will: • Utilize power point presentation to present the course information. • The board space to calculate problems with students. • There will be in class group work, where student will do in class exercises and turn the assignment to the instructor.
CELL PHONES
All cell phones, beepers and internet devices are expected to switch off completely. Disruption of class due to beepers or a cell phone is not allowable and the instructor will take the device from the student. All other electronic equipment that the faculty member deems not essential to the provision of academic learning is prohibited from being used in class

COURSE ASSESSMENT Tools

Assessment Method		Assessment Weight
Quizzes (4), (e, g, a, f)	Short quizzes are scheduled as shown in the semester schedule and all the quizzes will be counted.	10%
Tests (2) **T1= (b, e, g)…T2=(a, b, f)**	Two tests will be conducted during the semester and their average will be taken.	15%
Laboratory work	Laboratory experiments have been developed to coordinate with the content material. The detail of the 25% on page 6.	25%
Mid-term Exam (b, e, g, h)	The mid-term exam will be similar to the cases studied during the semester, but more updated.	20%
Final Exam (all)	The final exam will be designed to cover all the course contents and it will be close book.	30%
Total		**100%**

Grading: Passing Grade: 65%



Textbooks:

Name of the Textbook: Chemistry: the Central Science, 13th Edition
Authors: Theodore E. Brown, H. Eugene H. LeMay, Bruce E. Bursten and Catherine Murphy.
Publisher: Pearson Education Inc.
ISBN-13: ISBN- 13: 978-0-321-91041-7
Year: 2014

References:

1. Title: Chemistry (International Edition)
Authors: John E. McMurry, Robert C. Fay.
Edition: 6th Edition
ISBN-13: 978-0-321-76087-6
Year: 2012

2. Title: Chemistry
Authors: Raymond Chang
Edition: 10th Edition
ISBN-13: 978–0–07–351109–2
Year: 2010

3.Title: Chemistry for Engineering Students,
Authors: Lawrence S. Brown, Thomas A. Holme
Edition: 2nd Edition
ISBN-13: 978-1-4390-4791-0
Year: 2011

COURSE POLICY *(including plagiarism, academic honesty, attendance etc)*

Academic Dishonesty

Any type of dishonesty (plagiarism, copying another's test or home-work, etc) will not be tolerated. Students found guilty of any type of academic dishonesty are subject to failure in this course, plus further punishment by the University Consul.

Attendance:

- Students are expected to attend all lectures and must attend all examinations, quizzes, and practical exercises.
- There is no make-up work for students who miss classes without official permission.
- Student must arrange with the faculty to make-up the missed class.
- Students are subject to the regulation and policies mentioned in the KUST Student Handbook.

KUST guidelines for lateness are as follows: **Three occasions of lateness count as one absence**. (***You can be considered late after 5 minutes of the lecture time***).

GUIDELINES FOR SUCCESS

1. Work both independently and in groups of your study of peers, who can help you understanding the course material.
2. Pay a full attention in the class when your instructor explain the lesson, if you understand 70% directly from the instructor, then the 30% will be just practice exercises.
3. Understanding more than memorizing will help you a lot in passing exams.
4. Working many problems beyond the assigned homework will help mastering.
5. Ask a question when something is not clear.
6. Do not wait until the night before the exam to study: This approach does not work
7. Finally, attend every lecture and getting missed material is your responsibility.

REVISIONS TO THE SYLLABUS

This syllabus is subject to change. It is the duty of the instructor to inform students of changes in a timely fashion after approved by the Office of Quality Assurance Acreditaion (OQAA).

Course Schedule (Theory only)

weeks	reading	Chapter	Assignments
1	Introduction to the syllabus		
	Why we study Chemistry? Classification and Properties of Matter	Ch. 1	
2	Units of Measurements and Dimensional Analysis		
	Atomic weight and periodic table, molecular and Ionic compounds	Ch. 2	
3	Naming Inorganic Compounds with exercises		Quiz 1
	Types of Chemical equations, Formula weight, Avogadro's No		
Nawroz Holiday			
4	Finding the Empirical and molecular Formula using different methods	Ch.3	
	Empirical Formula and Quantitative information from a balanced equation, Limiting reactant.		
5	Finding the Empirical and molecular Formula using different methods		
	General Properties of Aqueous Solution; Chemical Reactions in Aqueous Solution	Ch.4	Quiz 2
6	Concentrations of Solution and Stoichiometry		
	Test 1: Ch. 1, 2, 3		
7	The Nature of Energy and the 1st Law of Thermodynamics, Enthalpies	Ch.5	
	Enthalpies of Reaction, and Calorimetry, Hess's Law		
Mid Exam: Ch. 1, 2, 3 and 4			
8	Enthalpies of Formation and Bond Enthalpies of the Reaction	Ch.5	
	The wave nature of Light, Bohr model	Ch.6	
9	The wave behavior and Quantum Mechanics and Atomic Orbitals		
	Many Electron Atoms, Electron Configurations and the periodic table		Quiz 3
10	Chemical Bonds, Octet Rule, Ionic and Covalent Bonding	Ch.8	
	Drawing Lewis Structure and Exceptions to the Octet Rule, Molecular Shape, VSEPR Model,		
11	Orbital Overlap, Hybrid Orbitals, Multiple Bonds	Ch 9	
	Gases Pressure units, Gas Laws and the Ideal Gas equation with further Applications		Quiz 4
12	Gas Mixture and Partial Pressures, Dalton's Law	Ch.10	
	Test 2: Chapters 5, 6, 8, 9		
13	Real Gases, Deviations from Ideal Behavior	Ch.10	
	Periodicity of Elements,	Ch.7	
14	Metals, Non-metals and Metalloids		
	Group trends for active metals and for selected non-metals		
15	Review		
Final Exam: all chapters are included			

General Chemistry I Lab

COURSE ASSESSMENT Tools

Assessment Method	Description	Assessment Weight
Pre-lab questions (4)	The pre-lab questions will be submitted as scheduled	**2%**
Quizzes (4)	Short quizzes are scheduled as shown in the schedule below and all the quizzes will be counted toward your final lab grade. If extra quiz will arranged then the highest quizzes will be count but quiz 1 must excluded.	**4%**
Lab reports (11)	Students will submit 11 reports; highest 10 laboratory grades will count toward your final lab grade	**10%**
Design Experiment (2)	Students will be given materials and instructions to design 2 chemistry experiments.	**2%**
Technique points	This part will be evaluated based on *following lab safety rules, attitude, ability to perform routine tasks in a timely manner*, and *neatness of the group place* including working area, used equipment and chemical).	**1%**
Final test	A final test will be designed to cover all the experiments' calculations, conclusions, title, drawing, and all questions related.	**6%**
Total		**25%**

W	Topic	Linking Chapters	Activities
W 3	**Experiment 1: Measurements and Calculating Density of Liquids and Solids** **Designing an Experiment is required in this week**	Ch.1	Quiz 1 (**In Week 2**)-Safety Rules
Nawroz Holiday			
W 4	**Experiment 2: Separating of the Component Mixture** *Lab report 1: measurements, Density of liquids and Solids*	Ch.1	Quiz 2-Exp. 1
W 5	**Experiment 3: Empirical formula of Hydrate** *Lab report 2: Separating of the Component Mixture*	Ch.3	***Pre-lab questions 1-Exp.2***
W 6	**Experiment 4: Determining Limiting Reactant and its Percent Yield** *Lab report 3: Empirical formula of Hydrate*		***Pre-lab questions2-Exp.4***
W 7	**Experiment 5: Reaction in Aqueous Solution** *Lab report 4: Determining Limiting Reactant and its Percent Yield*	Ch.4	
Mid-Term Test---No Laboratory Scheduled---			
W 8	**Experiment 6: Enthalpy and Heat Capacity** *Lab report 5: Reaction in Aqueous Solution*	Ch.5	
W 9	**Experiment 7: Hess's Law** *Lab report 6: Enthalpy and Heat Capacity*		Quiz 3-Exp 6 ***Pre-lab questions3-Exp. 7***

L;

W 10	**Experiment 8: Electron configuration of Atoms and Ions** *Lab report 7: Hess's Law*	Ch.6	
W 11	**Experiment 9: Differences Between Ionic and Covalent Compounds** *No report 8: Lab Exercise will be given*	Ch.8	Quiz 4-Exp. 8
W 12	**Experiment 10: Molecular Geometries of Covalent Molecules: Lewis Structure and VSEPR Theory** ***Designing an experiment is required for this week*** *Lab report 9: Differences Between Ionic and Covalent Compounds* *Lab report 10: Molecular Geometries of Covalent Molecules: Lewis Structure and VSEPR Theory*	Ch.9	***Pre-lab questions 4-Exp. 9***
W 13	**Experiment 11: Ideal Gas Law** *Lab report 11: Ideal Gas Law-In the same week*	Ch.10	
W 14	**Final Test**		