

توصيف مساق .....Chem 403101.....

1. معلومات مدرس المساق (Instructor)

Basem Fares Ali	اسم ( مدرس / منسق ) المساق :
9.15-10.15 Sun-Wed	الساعات المكتيبة :
2142	رقم المكتب والرقم الفرعي :
bfali@aabu.edu.joi	البريد الالكتروني :
NA	مساعد البحث والتدريس/المشرف/الفني (إن وجد):

2. وصف المساق (Course Description)

Introduction of fundamental chemical concepts for students to acquire a long-term, meaningful understanding of the basic chemical principles and relevant connections to those principles operating on the daily life.

3. بيانات المساق (Course Title)

المستوى : Level 1	اسم المساق : General Chemistry 1	رقم المساق : 403101
وقت المحاضرة : 8-9.15	المتطلب السابق / المتزامن : ---None---	طبيعة المساق : نظري/عملي
عدد الساعات الدراسية : 3	الفصل الدراسي : Summer	العام الجامعي : 2018 / 2019

4. أهداف المساق (Course Objectives)

To introduce the basic concepts and principles of chemistry	أ-
To teach the theoretical background for chemical principles	ب-
To enhance students ability of critical thinking, problem solving skills and to develop making critical decisions	ج-
To give the importance of chemistry principles and relevant connections to those principles operating in daily life	د-
To motivate positive thinking, logical and to understand the principles of nature related to chemical principles	

5. مخرجات التعلم (Intended Student Learning Outcomes)

(المعرفة والمهارات والكفايات)

يفترض بالطالب بعد دراسته لهذا المساق أن يكون قادرا على:

After completing the course, the student will be able to:

1. Master basic chemical terminology, nomenclature, and calculations; appreciate various types of measurements and their limitations
2. Recognize stoichiometric principles of chemical reactions, especially with application to reactions in solution and the gas phase
3. Identify the behavior and characteristics of solid, liquid, and gas phases of matter
4. Elucidate the basic concepts of thermochemistry
5. Utilize the modern atomic theory and the periodic properties and reactivity of elements and ions to understand the chemical reactions and molecular structure.
6. Recognize the concepts of chemical bonding and molecular structure
7. Have enhanced quantitative problem solving ability, with applications to general chemistry and other areas.

8. محتوى المساق (Course Content)

الموضوع	الأسبوع
<b>Chemical Foundations</b> An overview, Scientific method, Measurements, Significant figures, Dimensional Analysis.	الأول
<b>Atoms, Molecules and Ions</b> Modern view of atomic structure, Molecules and Ions, The Periodic Table, Naming of inorganic compounds.	الأول
<b>Chapter 3: Stoichiometry: Chemical Formulas and Equations</b> Atomic mass, The Mole, Molar Mass (Atomic and Formula and Molecular Weights), Percent composition of compounds, Chemical equations, Balancing chemical equations, Stoichiometric calculations: Limiting Reactants and percentage yield.	الثاني
<b>Chapter 4: Types of Chemical Reactions and Solution Stoichiometry</b> Strong and weak electrolytes, Solution Composition: Molarity and Solution Stoichiometry, Types of chemical reactions: precipitation, describing reactions in solution and stoichiometric calculations; acid-base reactions, neutralization and acid-base titrations; Oxidation/reduction (or redox) reactions, oxidation states or numbers writing balanced equations for chemical redox reactions.	الثالث + الرابع
<b>First Exam (End of week 4; Chapters 1-3)</b>	
<b>Chapter 5: Gases</b> Pressure and its units, The gas laws, ideal gas law, gas stoichiometry, molar mass and density of gas, Dalton's law of partial pressures, The kinetic molecular theory of gases, Effusion and diffusion, Real gases	الخامس
<b>Chapter 6: Thermochemistry</b> Nature of energy, Enthalpy and calorimetry, Hess's law, Standard enthalpy of formation, Present and new sources of energy ( <b>self reading</b> ).	الخامس

<b>Chapter 7: Atomic structure and Periodicity</b> Electromagnetic radiation, The nature of matter, The atomic spectrum of hydrogen, Bohr's Model of the Hydrogen Atom, The quantum mechanical model of the atom, Quantum numbers and Atomic Orbitals, Pauli exclusion principle, Polyelectronic atoms, Development of the Periodic Table, Electron Configurations and the Periodic Table (Aufbau principle, Hund's rule), Periodic Properties of the Elements (Ionization Energy, Electron Affinities, Sizes of atoms), The properties of a group (alkali metals).	السادس
<b>Basic Concepts of Chemical Bonding</b> Chemical bonds, Electronegativity, Bond polarity and dipole moments, Electronic configuration and sizes of Ions, binary ionic compounds, Partial ionic character of covalent bonds, Covalent Bond, Bond energies and chemical reactions, Localized electron bonding model, Lewis structures and the Octet Rule, Exceptions to the Octet Rule, Resonance Structures, Molecular structure (VSEPR model).	السابع
<b>Second Exam (End of week 7; Chapters 4-6)</b>	
<b>Chapter 9: Covalent bonding: Orbitals</b> Hybrid orbitals and the spatial arrangements, The Molecular Orbital (MO) model, bonding in homonuclear and heteronuclear diatomic molecules, Localized and MO model.	الثامن
<b>Eid Al-adha vacation</b>	التاسع
<b>Final Exam (week 10; All material covered)</b>	العاشر

**9. استراتيجيات التعليم والتعلم وطرق التقويم  
(Teaching and learning Strategies and Evaluation Methods)**

نوع التقويم/القياس (امتحان/عروض صفية/مناقشة/واجبات)	أنشطة التعلم	استراتيجيات التدريس	مخرجات التعلم	ت
- Examination	- Class notes - Continuous discussion of the material - Problem sets and solutions. - Assignments	- Power point Lectures - Homeworks - Problem solving - Oral discussions - Class room participation and assignments	Master basic chemical terminology, nomenclature, and calculations; appreciate various types of measurements and their limitations	1
- Examination	- Class notes - Continuous discussion of the material - Problem sets and solutions. - Assignments	- Power point Lectures - Homeworks - Problem solving - Oral discussions - Class room participation and assignments	Recognize stoichiometric principles of chemical reactions, especially with application to reactions in solution and the gas phase	2

- Examination	- Class notes - Continuous discussion of the material - Problem sets and solutions. - Assignments	- Power point Lectures - Homeworks - Problem solving - Oral discussions - Class room participation and assignments	Identify the behavior and characteristics of solid, liquid, and gas phases of matter	3
- Examination	- Class notes - Continuous discussion of the material - Problem sets and solutions. - Assignments	- Power point Lectures - Homeworks - Problem solving - Oral discussions - Class room participation and assignments	Elucidate the basic concepts of thermochemistry	4
- Examination	- Class notes - Continuous discussion of the material - Problem sets and solutions. - Assignments	- Power point Lectures - Homeworks - Problem solving - Oral discussions- Class room participation and assignments	Utilize the modern atomic theory and the periodic properties and reactivity of elements and ions to understand the chemical reactions and molecular structure	5
- Examination	- Class notes - Continuous discussion of the material - Problem sets and solutions. - Assignments	- Power point Lectures - Homeworks - Problem solving - Oral discussions- Class room participation and assignments	Recognize the concepts of chemical bonding and molecular structure	6
- Examination	- Class notes - Continuous discussion of the material - Problem sets and solutions. - Assignments	- Power point Lectures - Homeworks - Problem solving - Oral discussions - Class room participation and assignments	Have enhanced quantitative problem solving ability, with applications to general chemistry and other areas	7

### 1. تقييم الطلبة (Assessment)

توزيع الدرجات لكل أسلوب	توقيت التقييم	الأساليب المستخدمة
0	خلال الفصل	1-أعمال الفصل: (تقرير، وظائف، حضور)
25%	الأسبوع الرابع	2-امتحان تحريري أول
25%	الأسبوع السابع	2-امتحان تحريري ثاني
50%	أسبوع الامتحانات النهائية	3-امتحان تحريري نهائي

### 2. الكتاب المقرر (Text Book)

Chemistry	المرجع الرئيس
Steven S. Zumdahl, Susan A. Zumdahl	المؤلف
Mary Finch	الناشر
2014	السنة
Ninth edition	الطبعة
ISBN-10: 054705405X, ISBN-13: 9780547054056	الموقع الالكتروني للمرجع

### 3. المراجع الإضافية (References) (وتشمل الكتب والبحوث المنشورة في الدوريات او المواقع الالكترونية)

Chemistry: The Central Science by Theodore E. Brown, H. Eugene LeMay, Bruce E. Bursten, Catherine Murphy, Patrick Woodward, Matthew E. Stoltzfus, Pearson, 14 <sup>th</sup> edition, 2017.	-1
General Chemistry: Principles and Modern Applications, by Ralph H. Petrucci, F. Geoffrey Herring, Jeffrey D. Madura, Carey Bissonette, Pearson, 11 <sup>th</sup> edition, 2017.	-2
Chemistry: The Molecular Nature of Matter, by James E. Brady, Neil D. Jespersen Alison Hyslop, John Wiley & Sons Inc; 7th edition, 2014.	-3