



كلية العلوم.....

قسم الكيمياء.....

Chem 403215 توصيف مساق

1. معلومات مدرس المساق (Instructor)

Yaseen Ahmad Al-Soud	اسم (مدرس / منسق) المساق :
9.00-10.00 Sun-Tus-Ther	الساعات المكتيبة :
2118	رقم المكتب والرقم الفرعي :
alsoud@aabu.edu.joi	البريد الالكتروني :
NA	مساعد البحث والتدريس/المشرف/الفني (إن وجد):

2. وصف المساق (Course Description)

Introduction of fundamental organic chemistry, meaningful understanding of the basic organic chemistry principles and relevant connections to those principles operating on the daily life.

3. بيانات المساق (Course Title)

المستوى: Level 2	اسم المساق: organic chemistry for non chemistry student	رقم المساق: 403215
وقت المحاضرة: 9:00-10:00	المتطلب السابق Chem 403101 and 493102	طبيعة المساق: نظري
عدد الساعات الدراسية: 3	الفصل الدراسي: Summer	العام الجامعي: 2020 / 2021

4. أهداف المساق (Course Objectives)

<ul style="list-style-type: none"> Provides students with the essential knowledge and understanding of the fundamental principles of organic chemistry which will help them to intake other organic chemistry courses. 	أ-
<ul style="list-style-type: none"> Ensure that students can classify organic compounds according to their functional groups and understand their structure, Nomenclature, synthesis, physical and chemical properties. 	ب-
<ul style="list-style-type: none"> Ensure that students have good knowledge about Spectroscopy & stereochemistry. 	ج-
<ul style="list-style-type: none"> Getting knowledge about the importance of organic compounds and their uses in various applications. 	د-

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. Understand the basic principles of organic chemistry.
2. Understand the theoretical basis of physical and chemical properties of organic compounds
Identify the behavior and characteristics of solid, liquid, and gas phases of matter
3. Be able to classify organic compounds into their functional groups and will have a broad understanding of their physical and chemical properties, synthesis, and characterization. Utilize the modern atomic theory and the periodic properties and reactivity of elements and ions to understand the chemical reactions and molecular structure.
4. Will discover the importance the organic compounds in our daily life.

5. محتوى المساق (Course Content)

الموضوع	الأسبوع
<p>Chapter 1: Bonding and Isomerism How Electrons Are Arranged in Atoms, Ionic and Covalent Bonding, Carbon and the Covalent Bond, Carbon–Carbon Single Bonds, Polar Covalent Bonds Isomerism, Writing Structural Formulas, Abbreviated Structural Formulas , Formal Charge, Resonance, Arrow Formalism, The Orbital View of Bonding; the Sigma Bond, Carbon sp^3 Hybrid Orbitals, Tetrahedral Carbon; the Bonding in Methane, Classification According to Molecular Framework, Classification According to Functional Group, Multiple Covalent Bonds.</p>	الأول
<p>Chapter 2: Alkane and Cycloalkanes The Structures of Alkanes, Nomenclature of Organic Compounds, IUPAC Rules for Naming Alkanes, Alkyl and Halogen Substituents, Use of the IUPAC Rules, Sources of Alkanes, Natural Gas, Physical Properties of Alkanes and Nonbonding Intermolecular Interactions, Hydrogen Bonding, Conformations of Alkanes, Cycloalkane Nomenclature and Conformation, Cis–Trans Isomerism in Cycloalkanes, Isomers! Possible and Impossible, Summary of Isomerism, Reactions of Alkanes, Alternative Energy: The Benefits of Hydrogen, Methane, The Free-Radical Chain Mechanism of Halogenation</p>	الثاني
<p>Chapter 3: Alkene and Alkyne Definition and Classification, Nomenclature, Some Facts about Double Bonds , The Orbital Model of a Double Bond; the Pi Bond 3.5 Cis–Trans Isomerism in Alkenes, Addition and Substitution Reactions Compared, Polar Addition Reactions, Addition of Unsymmetric Reagents to Unsymmetric Alkenes; Markovnikov’s Rule, Mechanism of Electrophilic Addition to Alkenes, Markovnikov’s Rule Explained, Reaction Equilibrium: What Makes a Reaction Go?, Hydroboration of Alkenes, Addition of Hydrogen, Additions to Conjugated Systems, Oxidation of Alkenes, Addition Reactions of Alkynes</p>	الثالث

<p>Chapter 4: Aromatic Compounds Some Facts About Benzene, The Kekulé Structure of Benzene, Resonance Model for Benzene, Orbital Model for Benzene, Symbols for Benzene, Nomenclature of Aromatic Compounds, The Resonance Energy of Benzene 4.8 Electrophilic Aromatic Substitution, The Mechanism of Electrophilic Aromatic Substitution, Ring-Activating and Ring Deactivating Substituents , Ortho,Para-Directing and Meta-Directing Groups, The Importance of Directing Effects in Synthesis, Polycyclic Aromatic Hydrocarbons.</p>	الرابع
First Exam (End of week 4; Chapters 1-4)	
<p>Chapter 5: Stereochemistry Chirality and Enantiomers, Stereogenic Centers; the Stereogenic Carbon Atom , Configuration and the R-S Convention, The E-Z Convention for Cis-Trans Isomers, Polarized Light and Optical Activity, Properties of Enantiomers, Fischer Projection Formulas, Compounds with More Than One Stereogenic Center; Diastereomers, Meso Compounds; the Stereoisomers of Tartaric Acid, Enantiomers and Biological Activity</p>	الخامس
<p>Chapter 6: Organic halogen Compounds Nucleophilic Substitution, Examples of Nucleophilic Substitutions, Nucleophilic Substitution Mechanisms, The SN2 Mechanism, The SN1 Mechanism, The SN1 and SN2 Mechanisms Compared, Dehydrohalogenation, an Elimination Reaction; the E2 and E1 Mechanisms, Substitution and Elimination in Competition.</p>	السادس
<p>Chapter 7: alcohols phenols and thiols Nomenclature of Alcohols, Industrial Alcohols, Classification of Alcohols, Nomenclature of Phenols, Hydrogen Bonding in Alcohols and Phenols, Acidity and Basicity Reviewed, The Acidity of Alcohols and Phenols, The Basicity of Alcohols and Phenols, Dehydration of Alcohols to Alkenes, The Reaction of Alcohols with Hydrogen Halides, Other Ways to Prepare Alkyl Halides from Alcohols, A Comparison of Alcohols and Phenols, Oxidation of Alcohols to Aldehydes, Ketones, and Carboxylic Acids, Alcohols with More Than One Hydroxyl Group, Aromatic Substitution in Phenols, Oxidation of Phenols.</p>	السابع
<p>Chapter 8: Ethers and Epoxides Nomenclature of Ethers, Physical Properties of Ethers, Ethers as Solvents, The Grignard Reagent; an Organometallic Compound, Preparation of Ethers, Cleavage of Ethers, Epoxides (Oxiranes), Reactions of Epoxides, Cyclic Ethers</p>	الثامن
Second Exam (End of week 8; Chapters 5-8)	

<p>Chapter 9: Aldehydes and ketones Nomenclature of Aldehydes and Ketones, Some Common Aldehydes and Ketones, Synthesis of Aldehydes and Ketones, Aldehydes and Ketones in Nature, The Carbonyl Group, Nucleophilic Addition to Carbonyl Groups: An Overview, Addition of Alcohols: Formation of Hemiacetals and Acetals, Addition of Water; Hydration of Aldehydes and Ketones, Addition of Grignard Reagents and Acetylides, Addition of Hydrogen Cyanide; Cyanohydrins, Addition of Nitrogen Nucleophiles, Reduction of Carbonyl Compounds, Oxidation of Carbonyl Compounds, Acidity of α-Hydrogens; the Enolate Anion, Aldol Condensation, the Mixed Aldol Condensation, Syntheses via the Aldol Condensation</p>	التاسع
<p>Chapter 9: Carboxylic Acid and Their Derivatives Nomenclature of Acids, Physical Properties of Acids, Acidity and Acidity Constants, What Makes Carboxylic Acids Acidic?, Effect of Structure on Acidity; the Inductive Effect Revisited, Conversion of Acids to Salts, Preparation of Acids, Carboxylic Acid Derivatives, Esters, Preparation of Esters; Fischer Esterification, The Mechanism of Acid Catalyzed Esterification; Nucleophilic Acyl Substitution, Lactones, Saponification of Esters, Ammonolysis of Esters, Reaction of Esters with Grignard Reagents, Reduction of Esters, The Need for Activated Acyl Compounds, Acyl Halides, Acid Anhydrides, Amides, Summary of Carboxylic Acid Derivatives, The α-Hydrogen of Esters; the Claisen Condensation.</p>	العاشر + الحادي العاشر
Final Exam (week 10; All material covered)	الثاني عشر

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

ت	مخرجات التعلم	استراتيجيات التدريس	أنشطة التعلم	نوع التقويم/القياس (امتحان/عروض صفية/مناقشة/واجبات)
1	<ul style="list-style-type: none"> Understand the basic principles of organic chemistry. 	<ul style="list-style-type: none"> Encourage students to use computer technology and internet to get access to the course material. 	<ul style="list-style-type: none"> Suggested problems from each text book chapter. 	- Examination

- Examination	<ul style="list-style-type: none"> Solving problems in groups 	<ul style="list-style-type: none"> Link between theoretical and applied knowledge. 	<ul style="list-style-type: none"> Recognize the concepts of chemical bonding and molecular structure 	2
- Examination	<ul style="list-style-type: none"> Encourage peer discussion and offer one to one discussion. 	<ul style="list-style-type: none"> Open discussion amongst students under the supervision of their instructor 	<ul style="list-style-type: none"> Be able to classify organic compounds into their functional groups and will have a broad understanding of their physical and chemical properties, synthesis, and characterization. 	3
- Examination	<ul style="list-style-type: none"> Give students critical thinking questions 	<ul style="list-style-type: none"> Communicate and make discussions with students in English language 	<ul style="list-style-type: none"> Utilize the modern atomic theory and the periodic properties and reactivity of elements and ions to understand the chemical reactions and molecular structure. 	4
- Examination	<ul style="list-style-type: none"> Use molecular models to clarify shapes of organic compounds and their stereochemistry 	<ul style="list-style-type: none"> Encouraging group discussion related to the subject matter 	<ul style="list-style-type: none"> Will discover the importance the organic compounds in our daily life. 	5

- Examination	<ul style="list-style-type: none"> Developing self-study skills 	<ul style="list-style-type: none"> Encourage students to prepare for the new material to be given. 	<ul style="list-style-type: none"> Understand the theoretical basis of physical and chemical properties of organic compounds Identify the behavior and characteristics of solid, liquid, and gas phases of matter 	6
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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 الثامن	2- امتحان تحريري ثاني
50%	أسبوع الامتحانات النهائية	3- امتحان تحريري نهائي

2. الكتاب المقرر (Text Book)

Organic Chemistry. A Brief Survey of Concepts and Applications, Philip S. Bailey Jr. and Christina A. Bailey	المرجع الرئيس
Pearson College Div	المؤلف
1999	الناشر
6th Edition	السنة
<ul style="list-style-type: none"> ISBN-10 : 0139241191 ISBN-13 : 978-0139241192 	الموقع الإلكتروني للمرجع

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

<ul style="list-style-type: none"> Organic Chemistry, by, Solomon and Fryhle, Publisher: John Wiley & Sons Inc, 10th edition, 2010 	-1
<ul style="list-style-type: none"> Organic Chemistry, by, by John McMurry, Publisher: Brooks Cole, 8th edition, 2011 	-2
http://www.freebookcentre.net/Chemistry/organicChemistry-Books-Download.html http://en.wikipedia.org/wiki/Website	-3

