KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

ORGANIC CHEMISTRY COURSE SYLLABUS			
Course Title	Organic Chemistry		
Course Code	CHM 2415	**No. of Credits**	3
Department	Medical Laboratory Science (MLS)	**College**	Science
Pre-requisites Course Code	CHM 2411C	**Co-requisites Course Code**	
Course Coordinator(s)	Ms. Mariam Merry		
Email	mariam.yacoub@komar.edu.iq	**IP No.**	130
Other Course Teacher(s)/Tutor(s)	None		
Class Hours	Sec1-Monday/Wednesday (12:00 – 1:30) -Room 210. Sec2- Sunday/Tuesday (2:00 – 3:30) -Room 210		
Office Hours	By making an appointment via email Office location is in the third floor-Room 313		
Course Type	College Requirement		
Offer in Academic Year	Fall 2015		

COURSE DESCRIPTION

CHM 2415 course will emphasize on nomenclature, properties, synthesis, and reactions of aliphatic and cyclic alkanes, alkenes, and alkynes, aldehydes, ketones, alcohols, ethers, alkyl halides, and carbonyl compounds including the mechanism of their reactions in addition to the properties and reactions of carbohydrates, amines, and amino acids.

COURSE OBJECTIVES

The objective of this course is to make students have knowledge regarding the structure, synthesis of different molecules and mechanisms of reactions. Upon completion of the course, students will have a solid foundation in carbon containing compounds and apply their knowledge to solve complex problems which help them to gain skills for other fields such as medicine and engineering.

COURSE LEARNING OUTCOMES

1. Indicate the structure, nomenclature, and synthesis of hydrocarbons, alcohol, ethers, carbonyl compounds, amines and amino acids.
2. Describe the properties and reactivity of important functional groups including all hydrocarbons, alcohol, ethers, carbonyl compounds, carbohydrates, amines, and amino acids.
3. Write detailed mechanisms for important reaction classes: electrophilic substitution and carbonyl nucleophilic addition reactions.
4. Identify reaction of alcohols and ethers in connection with reactions with alkenes, alkynes, and alkyl halides.
5. Differentiate the types of lipids: waxes, triglycerides, phospholipids, steroids, prostaglandins, and terpenes.

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GUIDELINES ON GRADING POLICY

A	95-100%	**C**	70-74%
A-	94-90%	**C-**	65-69%
B+	87-89%	**D+**	60-64%
B	83-86%	**D**	55-59%
B-	80-82%	**D-**	50-54%
C+	75-79%	**F**	0-49%
W	Withdrawal	**I**	Incomplete
Note: Passing Grade is 65% and above			

COURSE CONTENT

Course topics include:

• Chapter 4: Alkanes and cycloalkanes	• Chapter 20: Aldehydes and Ketones
• Chapter 7: Substitution Reactions	• Chapter 21: Carboxylic acids and their derivatives
• Chapter 8: Alkenes: Structure and properties via elimination reactions	• Chapter 23: Amines
• Chapter 9: Addition reaction of alkenes	• Chapter 24: Carbohydrates
• Chapter 10: Alkynes	• Chapter 25: Amino acids, peptides, and proteins
• Chapter 13: Alcohols and phenols	• Chapter 26: Lipids
• Chapter14: Ether and epoxides: thiols and sulfides	

CLASS REQUIREMENT

- Organic Chemistry, 2nd Edition. David Klein. John Wiley and Sons, Inc. 2015. ISBN: 978-1-118-45228-8.
- A Scientific Calculator
- Notebook

COURSE TEACHING AND LEARNING ACTIVITIES

This course will carried out in 3 hours, 2 times lecture per week. The semester has 15-instructional weeks followed by one week of exam. Course instructor will:

- Utilize power point presentation to present the course information.
- The board space to calculate problems with students.
- Self-depending practice problems to be assigned to the students at home to enhance their understanding.

COURSE ASSESSMENT TOOLS

Assessment Tool	Description	Weight
Quizzes (5)	Short quizzes are scheduled as shown in the semester schedule and all the quizzes will be counted.	**10%**
Tests (2)	Two tests will be conducted during the semester and their average will be taken. The test might include multiple-choice questions, True/False, short answers, problem solving.	**15%**
Mid-Term Exam	The students should find the mid-term exam easer because it will be similar to the cases studied during the semester, but more updated.	**20%**
Laboratory work	Laboratory experiments have been developed to coordinate with the content material. (The lab grade will be discussed in a separate syllabus for the lab).	**25%**
Final Exam	The final exam will be close book, no materials are allowed except the one that will be given by the instructor.	**30%**

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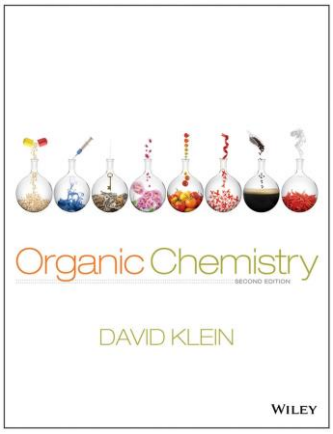
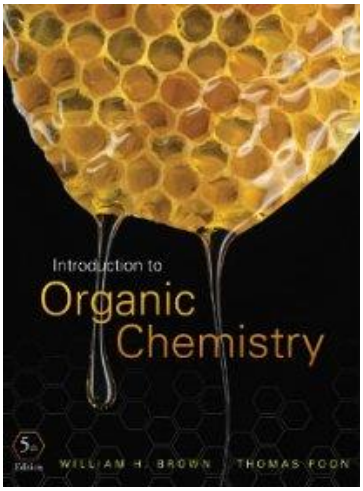
TEXTBOOK:

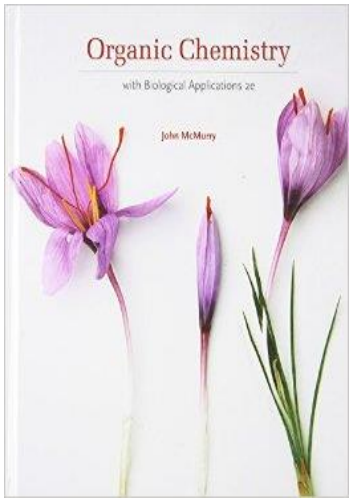


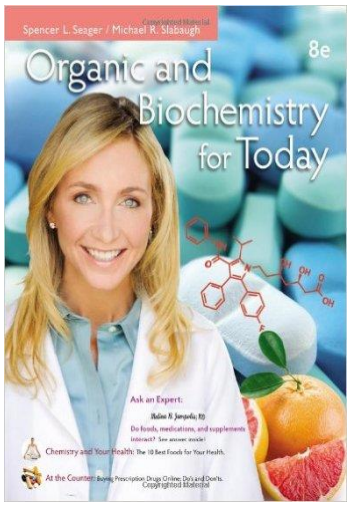
David Klein, Organic Chemistry, 2nd Edition. John Wiley and Sons, Inc. 2015. ISBN: 978-1-118-45228-8.

REFERENCES:

- William H. Brown, Thomas Poon , Introduction to Organic Chemistry, 5th Edition, John Wiley and Sons, Inc 2014. ISBN 978-1118-083383
- John McMurry: Organic Chemistry with Biological Application, 2nd Edition, Cengage Learning. 2011. ISBN-13: 978-0-495-39144-9
- Spencer L. Seager, Michael R. Slabaugh, General, Organic, and Biochemistry, 8th Edition, Brooks/Cole, Cengage Learning. 2014. ISBN-13: 978-1-133-60227-9.







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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. Finally, attend every lecture and getting missed material is your responsibility.

E-MAILETIQUETTEOF COMMUNICATION

Please note the following in regards to e-mail communication:

1. It is your responsibility to update your Komar-email address daily for course updates. Faculty will not be able to contact you if you fail to have an email address and you could potentially miss important information about the course.
2. Email will only be answered if it comes from Komar-email address. Faculty will not respond to unprofessional email addresses.
3. Mail should have a subject heading which reflects the content of the message.
4. Your message should begin with an appropriate salutation, including the name of the person being addressed, and end with thanks followed by your full name of the sender.
5. Emails that do not follow the above guidelines, or are written in an unprofessional and / or disrespectful manner as well as anonymous emails will not be addressed.
6. Failure to check e-mail or “classroom.google.com” may result in you missing important assignments and subsequently affect your grade.

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CELL PHONES
All cell phones and beepers are expected to be switched to vibrating mode if available and turned off completely if this feature is not an option. Disruption of class due to beepers or a cell phone will not be tolerated and the student will be asked to leave class. All other electronic equipment that the faculty member deems not essential to the provision of academic learning is prohibited from being used in class.
REVISIONTO 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 approval of Quality Assurance Office (QAO).

W	Lec. No.	Topics	Ch.	Activities
W1	L1	Introducing course syllabus, nomenclature of alkane		**We will use the lab time during the first two weeks for lecturing**
	L2	uses of Alkanes, constitutional isomers of alkanes, Drawing Newman projection, conformational isomers of ethane, propane and butane	4	
W2	L3	Cycloalkanes, conformations of cyclohexane, drawing chair of conformations, monocyclohexane, cis-trans stereoisomerism	4	
	L4	Substitution reaction of alkyl halides, possible mechanisms,	7	
W3	L5	drawing the complete mechanisms of SN2 and SN1 reactions, Determine the predominate mechanism	7	Quiz 1-Ch.4
	L6	Nomenclature of alkene, stability, elimination reactions, stereoisomerism in alkene,	8	
W4	L7	The E2 and E1 elimination reactions, Substitution vs. elimination to identify, reagent, mechanisms, and products.	8	
	L8	Addition reaction of alkenes: hydro-halogenation, acid-catalyst hydration, hydroboration-oxidation,	9	Quiz 2-Ch. 7
W5	L9	Halogenation and halohydrin formation, dihydroxylation, oxidative cleavage, synthesis strategies.	9	
	L10	Nomenclature of alkyne, preparing alkyne, reduction of alkyne, hydro-halogenation, hydration, of alkynes,	10	
W6	L11	**Test 1: 4, 7, 8**		
	L12	Halogenation and alkylation of alkynes, synthesis strategies.	10	Quiz 3-ch. 9
W7	L13	Structure, properties, and acidity of alcohols, preparation of alcohol via substitution, preparation of alcohol via reduction	13	
	L14	, preparation of alcohol via Grignard reagent , Reaction of alcohols: Substitution & elimination, oxidation,	13	
Mid-Term Test: 4, 7, 8, 9 and 10				
W8	L15	Nomenclature, structure, properties of ethers, preparation and reactions	14	
	L16	Nomenclature, properties of epoxides, preparation, Thiols and sulfides	14	Quiz 4-Ch.13
W9	L17	Nomenclature, preparation of Aldehyde and ketones, nucleophilic addition reaction (oxygen, nitrogen, sulfur, hydrogen and carbon nucleophiles)	20	
	L18	Continue from previous lec, Baeyer-Villiger oxidation of aldehyde and ketones	20	
W10	L19	Nomenclature, structure, properties, preparations and reactions of carboxylic acids.	21	
	L20	Preparation and reaction of acid chloride, acid anhydride, esters, amides, and nitriles	21	Quiz 5-Ch.14

W11	L21	Nomenclature, properties, preparations of amines via substitution and reductive amination	23	
	L22	Acylation of amines, Hofmann elimination, reaction with nitrous acid	23	
W12	L23	Classification and reaction of monosaccharides, configuration of Aldoses and ketoses	24	
	L24	Disaccharides and poly saccharides, amino sugar	24	
New Year Holiday				
W13	L25	Structure, properties and synthesis of amino acids, structure and synthesis of peptides	25	
	L26	**Test 2: Ch. 13, 14, 20 and 21**		
W14	L27	Protein structure and synthesis	25	
	L28	Waxes, Triglycerides steroids and prostaglandins	26	
W15	L29	Review		
	L30	Review		
W16	**Final Test: all chapters included**			