



Course Specifications

Course Title:	Chemistry of Aliphatic Compounds
Course Code:	4022132-3
Program:	Chemistry
Department:	Chemistry
College:	Applied Science
Institution:	Umm Al-qura University



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A. Course Identification

1. Credit hours: 3 hrs
2. Course type a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/> b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 3 rd level/2 nd year
4. Pre-requisites for this course (if any): General Chemistry 1
5. Co-requisites for this course (if any): -

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	45
3	Tutorial	--
4	Others (specify)	6
	Total	81
Other Learning Hours*		
1	Study	45
2	Assignments	10
3	Library	6
4	Projects/Research Essays/Theses	4
5	Others (specify)	16
	Total	81

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Course include the methods of nomenclature, chemical properties and synthesis of all families of aliphatic compounds in addition to some physical properties.

2. Course Main Objective

By the end of this course student will be familiar with nomenclature, chemical properties and synthesis of aliphatic compounds

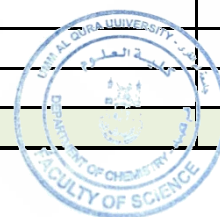
3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Recognize the general IUPAC rules for nomenclature of different organic classes	K1
1.2	Name different organic classes and organometallic compounds using common and IUPAC system	K1
1.3	Know the classifications in different organic families	K4
1.4	Describe the different methods of preparations of organic compounds	K3
1.5	Familiar with the physical properties of different organic molecules and their relation with the structure	K2
1.6	Select the proper method of preparation of an organic molecule	K3, K4
1.7	Identify the different conformations of alkanes and cycloalkanes	K2
1.8	Write a mechanism for a chemical organic transformation	K2
1.9	Determine the type of mechanism and intermediates in different organic reactions	K2, K4
1.10	Recognize the industrial use of most famous organic molecules	K5
1.11	Memorize different name reactions in organic chemistry	K1
1.12	Outline the different uses of organometallic compounds	K3, K6
1.13	Define inductive and resonance effect	K2
2	Skills :	
2.1	Apply the IUPAC rules for all organic families	S1
2.2	Compare between IUPAC nomenclature and common nomenclature for organic compounds	S1
2.3	Explain the different strategies for preparation of organic compounds	S2, S3
2.4	Analyze the reasons for the unique physical properties in some organic compounds	S1
2.5	Predict the most stable conformation of alkanes and cycloalkanes	S5
2.6	Summarize the different reactions of organic compounds	S1
2.7	Account for the acidity and basicity of different organic compounds	S2
3	Competence:	
3.1	Evaluate the different methods of preparation of organic compounds	C1
3.2	Demonstrate a synthetic pathways for synthesis of organic molecules	C1
3.3	Enhancing the ability of students to use computers and internet.	C3
3.4	Interpret chemical data	C2
3.5	Know how to write a report.	C1
3.6	Ability to work in a team to perform a specific experimental tasks.	C1
3.7	Ability to work independently to handle chemicals	C1
3.8	Ability to communicate results of work to classmate and participation in class or laboratory discussions	C4

C. Course Content

No	List of Topics	Contact Hours
1	Nomenclature of Hydrocarbons	2
2	Alkanes (Preparation, physical properties, chemical reactions cycloalkanes, conformations in cycloalkanes)	2

3	Alkenes (Preparation, physical properties, chemical reactions conjugated dienes, free radical addition, Diels alder reaction, and 1,4 cycloadditions in dienes)	4
4	Alkynes (Preparation, Acidity of terminal alkynes, chemical reactions, industrial uses of alkynes)	2
5	Alkyl halides and dihalides (nomenclature, preparations and reactions)	2
6	Alcohols and dihydric and trihydric alcohols (nomenclature, chemical properties) and thioalcohols	2
7	Ethers (nomenclature, preparations and chemical properties) and thioethers	2
8	Organometallic compounds and Grignard reagents	2
9	Carbonyl compounds (nomenclature, preparation and chemical properties)	4
10	Carboxylic acids and their derivatives (nomenclature, preparation and chemical properties)	2
11	Amines (nomenclature, preparation and chemical properties)	2
12	Inductive effect, resonance effect and stereochemistry	2
Total		



D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Recognize the general IUPAC rules for nomenclature of different organic classes	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios long and short essays posters lab manuals
1.2	Name different organic classes and organometallic compounds using common and IUPAC system	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios long and short essays posters lab manuals
1.3	Know the classifications in different organic families	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios long and short essays posters lab manuals
1.4	Describe the different methods of preparations of organic compounds	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios long and short essays posters lab manuals
1.5	Familiar with the physical properties of different organic molecules and their relation with the structure	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios long and short essays posters lab manuals

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.6	Select the proper method of preparation of an organic molecule	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • long and short essays posters lab manuals
1.7	Identify the different conformations of alkanes and cycloalkanes	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • long and short essays posters lab manuals
1.8	Write a mechanism for a chemical organic transformation	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • long and short essays posters lab manuals
1.9	Determine the type of mechanism and intermediates in different organic reactions	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • long and short essays posters lab manuals
1.10	Recognize the industrial use of most famous organic molecules	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • long and short essays posters lab manuals
1.11	Memorize different name reactions in organic chemistry	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • long and short essays posters lab manuals
1.12	Outline the different uses of organometallic compounds	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • long and short essays posters lab manuals
2.0	Skills		
2.1	Apply the IUPAC rules for all organic families	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • posters demonstrations
2.2	Compare between IUPAC nomenclature and common nomenclature for organic compounds	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • posters

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
			demonstrations
2.3	Explain the different strategies for preparation of organic compounds	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios posters demonstrations
2.4	Analyze the reasons for the unique physical properties in some organic compounds	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios posters demonstrations
2.5	Predict the most stable conformation of alkanes and cycloalkanes	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios posters demonstrations
2.6	Summarize the different reactions of organic compounds	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios posters demonstrations
2.7	Account for the acidity and basicity of different organic compounds	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios posters demonstrations
		<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems portfolios posters demonstrations
3.0	Competence		
3.1	Evaluate the different methods of preparation of organic compounds	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> web-based student performance systems individual and group presentations
3.2	Demonstrate a synthetic pathways for synthesis of organic molecules	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> web-based student performance systems individual and group presentations
3.3	Enhancing the ability of students to use computers and internet.	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> web-based student performance systems individual and group presentations
3.4	Interpret chemical data	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> web-based student performance systems

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		<ul style="list-style-type: none"> • Scientific discussion • Library visits Web-based study	individual and group presentations
3.5	Know how to write a report.	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits Web-based study	<ul style="list-style-type: none"> • web-based student performance systems individual and group presentations
3.6	Ability to work in a team to perform a specific experimental tasks.	<ul style="list-style-type: none"> • Class discussions • Research activities 	<ul style="list-style-type: none"> • Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
3.7	Ability to work independently to handle chemicals	<ul style="list-style-type: none"> • Class discussions • Research activities 	<ul style="list-style-type: none"> • Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
3.8	Ability to communicate results of work to classmate and participation in class or laboratory discussions	<ul style="list-style-type: none"> • Class discussions • Research activities 	<ul style="list-style-type: none"> • Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid-term exam	8-10	20%
2	Assignments and activities		5%
	Quizzes and class discussions		5%
3	Practical Exam	15	30%
4	Final Exam.(2 hours exam)	16	40%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- We have faculty members to provide counseling and advice.
- Office hours: During the working hours weekly.
- Academic Advising for students (about 20-25 student/ one faculty member).

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	John McMurry's " <i>Organic Chemistry, 8th edition, International Edition</i> " 2011, Brooks/Cole.
Essential References Materials	<ol style="list-style-type: none"> 1. Amit Arora "<i>Introductory Organic Chemistry</i>" 2006, Discovery Publishing House New Delhi 2. John McMurry's "<i>Organic Chemistry, 8th edition, International Edition</i>" 2011, Brooks/Cole 3. T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "<i>Organic Chemistry, 11th Edition, International Student Version</i>" 2013, John Wiley & Sons.
Electronic Materials	<ul style="list-style-type: none"> • Lecture Hand-out available as a PowerPoint presentation. • http://www.chemweb.com • http://www.sciencedirect.com • http://www.rsc.org
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> • Classrooms capacity (30) students. Providing teaching halls including computers and projector.
Technology Resources (AV, data show, Smart Board, software, etc.)	Teaching halls equipped with computer and data show.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	No other requirements.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Program leader	Direct
Extent of achievement of CLO's	Peer Reviewer	Direct

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Program leader	Direct
Extent of achievement of CLO's	Peer Reviewer	Direct
Quality of learning resources	Students and Faculty members	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

Received by: Dr. Ismail Althagafi

Department Head

Signature:



Date: 20/12/2019

