هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title:	**Aliphatic Organic Chemistry**
Course Code:	**231CHEM-3**
Program:	**Bachelor in Chemistry**
Department:	**Chemistry**
College:	**College of Science**
Institution:	**Jazan University (JU)**
Version:	**T104 2022**
Last Revision Date:	**25 December 2022**

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3h				
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered:	Level 4 Year 2				

4. Course general Description

Course Title	Course Number	Contact Hours (CU)		Credit unit (CU)	Year	Level	Pre-requisite
		Lec.	Prac.				
Aliphatic Organic	231CHEM3	2	2	3	2	4	101CHEM4

Course objectives: They are to identify the following.

- *Identifying and analyzing the structure of organic compounds by recognizing main functional groups, naming the compounds using the I.U.P.A.C. system, and predicting their properties using the type of bonding, hybridization state, intermolecular forces, and stereochemistry.*
- *Describing the reactions: nucleophilic substitution, elimination, and electrophilic addition, and apply this knowledge to predict the major product in organic reactions, such as those involving hydrocarbons,*
- *analyzing the nature of a reagent: as a nucleophile, or electrophile and use this knowledge to propose the synthesis of organic compounds, such as a hydrocarbon, alkyl halides, alcohols, or alkenes.*
- *demonstrate proficiency in organic laboratory skills as they pertain to: chemical information, safe handling, use, and disposal of organic compounds; identify different unknown organic compounds and use of instrumentation, and writing laboratory reports following current scientific journal styles.*

Syllabus: A-Theoretical contents

- *Principles of organic chemistry and its importance – molecular structure and properties of organic compounds – functional groups in organic compounds –principle organic reactions – studying different classes of aliphatic organic compounds including; nomenclature, chemical structure, physical properties, methods of preparation, chemical reactions and common uses of: saturated and unsaturated aliphatic compounds*

Syllabus: A-Practical contents

Basic knowledge concerning general Safety Rules, Lab Equipment, Basic Laboratory Techniques, Measuring Volume and melting point, Purification of Organic Compounds, and sublimation. Finally, Identification of an unknown liquid and solid organic compounds.

5. Pre-requirements for this course (if any): ***101CHEM4***

6. Co- requirements for this course (if any): ***None***

7. Course Main Objective(s)

This course aims to give students the basic knowledge concerning saturated and unsaturated aliphatic organic compounds, their nomenclature, methods of preparation and their most important chemical reactions.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	22	100
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	22
2.	Laboratory/Studio	22
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	44

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding; (Upon completion of the course, student will be able to)			
1.1	Demonstrate a broad knowledge and understanding in the hybridization, bonding in organic compounds, the nomenclature of organic compounds, organic reactions, isomerism of organic compounds, reactions, and preparations	K(1.1)	***lecture***	***Objective Q***

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	of alkane, alkene, alkyne, and aromatics. (I)			
1.2	Describe the reactions: nucleophilic substitution, elimination, and electrophilic addition, and apply this knowledge to predict the major product in organic reactions, such as those involving hydrocarbons, alkyl halides, alkenes, alkynes, and aromatic. (I)	K(1.2)	***lecture***	***Objective Q Essay Q***
2.0	Skills: (Upon completion of the course, student will be able to)			
2.1	analyze the nature of a reagent: as a nucleophile or electrophile and use this knowledge to propose the synthesis of organic compounds, and draw their structure, and differentiate between them. (I)	S(2.1)	***lecture***	***Essay Q & Solve Problems***
2.2	perform experiments for the investigation and identification of unknown solid organic compounds, and write reports about It. (I)	S(2.2)	***Lab work***	***Lab report***
2.3	Examine and follow proper procedures and regulations for safe handling, use, and disposal of chemicals (I)	S(2.3)	***Lab work***	***Objective Q*** (Safety Quiz)

C. Course Content

No	List of Topics	Contact Hours
1.	***Introduction to Organic Chemistry***	***1***
2.	***Structure, chemical bonding in organic compounds, and formal charges***	***1***
3.	***SP3, SP2, SP hybridization of methane, ethane and ethyne.***	***1***
4.	***Functional groups***	***2***
5.	***Isomerism, types of structural isomerism and types of stereoisomerism.***	***2***
6.	***Organic reactions and Acid-Base reactions***	***3***
7.	***Nomenclature of Alkanes, Alkenes, and Alkynes and their cyclic forms.***	***3***
8.	***Alkenes and alkynes, preparation, reactions and their application***	***4***
9.	***Aromatic compounds, aromaticity, and Nomenclature***	***2***
10.	***Electrophilic aromatic substitution for benzene, monosubstituted, disubstituted, and poly-substituted aromatics***	***3***

11.	***Identification of an unknown liquid and solid organic compounds (LAB)***	22
Total		44

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	***Homework assignment***	***3-5*** and ***6-11***	***5 %***
2.	***Mid-term exam***	***6-8***	***15 %***
4.	***LAB Sheet***	***11***	***5 %***
5.	***Quiz in Safety***	***9***	***3%***
6.	***Final practical exam***	***11***	***12 %***
7.	***Lab report***	***2-10***	***10 %***
9.	***Final Exam***	12-14	***50 %***
	Total		***100 %***

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Organic Chemistry, 9e Written by Jr. Leroy G. Wade, Jan William Simek, et al
Supportive References	Organic Chemistry (tenth edition) Written by T. W. Graham Solomons and Craig B. Fryhle http://chemistry.com.pk/books
Electronic Materials	https://www.khanacademy.org/science/organic-chemistry https://www.organic-chemistry.org/ https://en.wikipedia.org/wiki/Organic_chemistry https://www.masterorganicchemistry.com/organic-1/
Other Learning Materials	https://www.youtube.com/watch?v=cAxJw_W05ZY https://www.chemguide.co.uk/orgmenu.html https://www2.chemistry.msu.edu/faculty/reusch/virttxtjml/intro1.htm

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1 Lecture room(s) for groups of 50 students
Technology equipment (Projector, smart board, software)	Smart board, Data show, Black board, internet
Other equipment (Depending on the nature of the specialty)	Glassware, chemicals, hotplates, water bathes, flam, electrical balance, UV lamb, and IR.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Likert-type Survey CES) Indirect
The extent of achievement of course learning outcomes	Instructor & Course coordinator	Classroom evaluation (direct & indirect
Quality of learning resources	Program coordinator	Indirect
Exam Quality assessment		Indirect
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Chemistry Department Council **CHEMS2301**
REFERENCE NO.	**CHEMS230104**
DATE	**11/1/2023G – 18/06/1444H**

H. Attachments

1- Practical Work

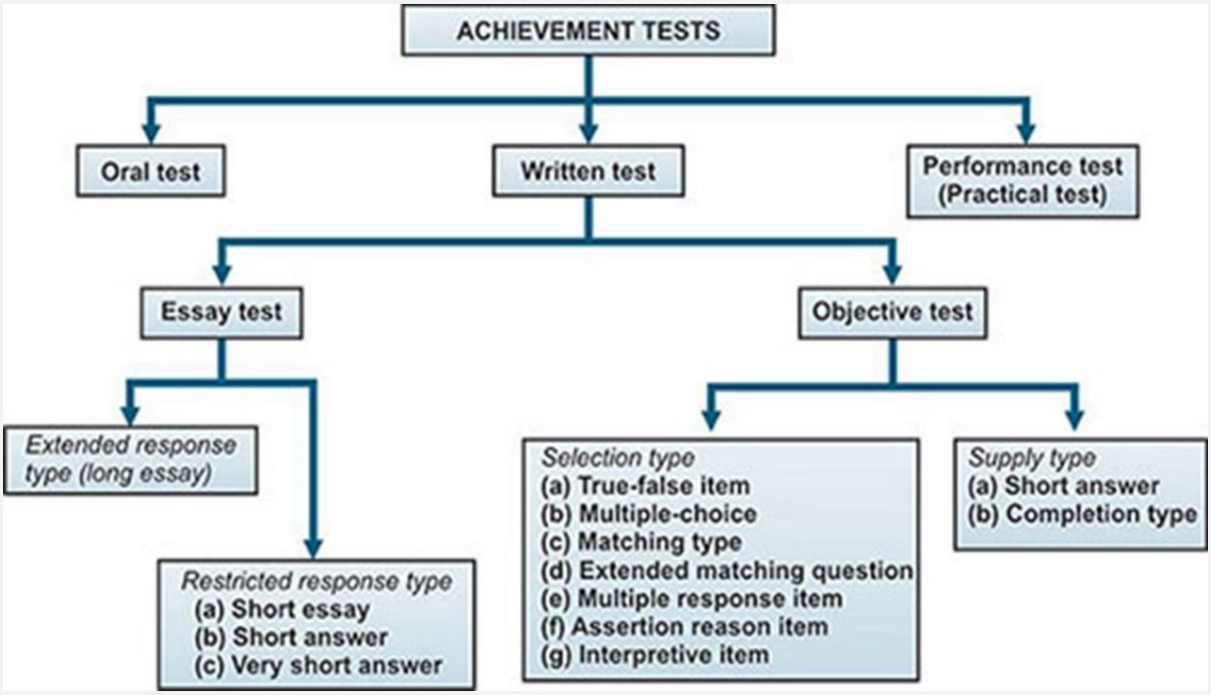
Week	EXPERMENTAL TITLE		Remarks
1	General Safety Rules, Lab Equipment, and Basic Laboratory techniques.		
2	Measuring volume and melting point		None
3	Purification of Organic Compounds and sublimation		None
4	Simple Liquid Organic Compounds, Identification of hydrocarbons and alcohols		None
5	Identification of Phenols, Aldehydes, and Ketones		None
6	Identification of Carboxylic acid and amines		None
7	Exam of Simple Liquid Organic Compounds		None
8	Simple Solid Organic Compounds and identifications of carbohydrates		None
9	Identification of Carboxylic acid, salts of carboxylic acids, and urea		None
10	Identification of Aniline salts		
11	Final Exam		

Blue Print

Course Name	Aliphatic Organic Chemistry
Course Code	3-CHEM-231

PLOs	K1	K2	S1	S2	S3	S4	V1	V2
CLOs	1.1	1.2	2.1	2.2	2.3			
Marks	30	25	15	27	3			

Learning Domain	PLOs	CLOs	Assessment Type	Assessment Tool	No of Questions	Marks of the Assessment	Weight of the Assessment
Knowledge & understanding	**K1**	**1.1 (30 M)**	Homework	Objective Question	**1-2**	**1**	**1%**
			Mid term	Objective Question	**1-2**	**7**	**7%**
			Final Exam	Objective Question	**1-2**	**22**	**22%**
	K2	**1.2 (25 M)**	Homework	Objective Question & short answer questions	**1-2**	**2**	**2%**
			Midterm	Objective Question & short answer questions	**1-3**	**5**	**5%**
			Final Exam	Objective Question & short answer questions	**1-3**	**18**	**18%**
Skills	**S1**	**2.1 (15 M)**	Homework	Short answer questions & solving Problems	**1-3**	**2**	**2%**
			Midterm	Short answer questions & solving Problems	**1-3**	**3**	**3%**
			Final Exam	Short answer questions & solving Problems	**1-3**	**10**	**10%**
	S2	**2.2 (27 M)**	Practical Sheet	Objective Question & short answer questions	7	**7**	**7%**
			Final Practical Exam	I Task experiment	---	**20**	**20%**
	S3	**2.3 (3 M)**	***Safety EXAM***	Objective Question	6	**3**	**3**
TOTAL		**100**				**100**	**100%**


ACHIEVEMENT TESTS
Oral test
Written test
Performance test (Practical test)
Essay test
Objective test
Extended response type (long essay)
Restricted response type
(a) Short essay
(b) Short answer
(c) Very short answer
Selection type
(a) True-false item
(b) Multiple-choice
(c) Matching type
(d) Extended matching question
(e) Multiple response item
(f) Assertion reason item
(g) Interpretive item
Supply type
(a) Short answer
(b) Completion type