هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

# Course Specification
(Bachelor)

| | |
|---|---|
| **Course Title:** | Organic chemistry 1 |
| **Course Code:** | CHEM 1202 |
| **Program:** | Bachelor of Science in Chemistry |
| **Department:** | Chemistry |
| **College:** | Science |
| **Institution:** | University of Tabuk |
| **Version:** | 2023 |
| **Last Revision Date:** | 17/9/2023 |

كلية العلوم
جامعة تبوك
Faculty of Science

## Table of Contents

## A. General information about the course:

### 1. Course Identification

| 1. Credit hours: 3 Hours ( 2 Theoretical + 1 Experimental ) | | | | | |
|---|---|---|---|---|---|
| **2. Course type** | | | | | |
| **A.** | ☐University | ☐ College | ☒ Department | ☐Track | ☐Others |
| **B.** | ☒ Required | | ☐Elective | | |
| **3. Level/year at which this course is offered: ( 3rd level/2nd Year** | | | | | |
| **4. Course general Description:** | | | | | |
| Course includes the methods of nomenclature, chemical properties and synthesis of all families of aliphatic compounds (in addition to some physical properties. The aim of this course is to explain, discover and examine the concepts in aliphatic organic chemistry for different functional groups and their chemical reactions. The course will design experiments for chemical reactions involving organic compounds. | | | | | |
| **5. Pre-requirements for this course** (if any)**:** | | | | | |
| CHEM1101 | | | | | |
| **6. Pre-requirements for this course** (if any)**:** | | | | | |
| NA | | | | | |
| **7. Course Main Objective(s):** | | | | | |
| ▪ Predict and explain patterns in shape, structure, bonding, hybridization, formal charge, stability, acidity, basicity, and solubility by understanding and applying concepts of organic chemical structure and bonding and stability.<br>▪ Provide correct IUPAC names for different class of aliphatic organic compounds<br>▪ Recognize and apply functional groups by classifying organic molecules by their functional groups, and identify fundamental properties associates with those functional groups.<br>▪ Predict reaction products in the reaction of different class of functional group | | | | | |

### 2. Teaching mode (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 1 | Traditional classroom | **60** | % 100 |
| 2 | E-learning | 0 | % 0 |

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 3 | Hybrid<br>• Traditional classroom<br>• E-learning | 0 | % 0 |
| 4 | Distance learning | 0 | % 0 |

## 3. Contact Hours (based on the academic semester)

| No | Activity | Contact Hours |
|---|---|---|
| 1. | **Lectures** | 30 |
| 2. | **Laboratory/Studio** | 30 |
| 3. | **Field** | 0 |
| 4. | **Tutorial** | 0 |
| 5. | **Others (specify)** | 0 |
| **Total** | | 60 |

## 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** | | | |
| 1.1 | Recognize structure, bonding, , and reactivity of organic compounds. | K1 | Traditional lectures<br>Working in groups Exercises during the class<br>Brain storming<br>Homework's assignments<br>Effective class discussion | Written examinations<br>Quizzes<br>Assignments<br>Activities during lectures (class room participation)<br>assignments |
| 1.2 | recall the different class of organic compounds and their reactions based on | K2 | Traditional lectures<br>Working in groups Exercises during the | Written examinations<br>Quizzes |

| Code | Course Learning Outcomes | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| | their functional group | | class<br>Brain storming<br>Homework's assignments<br>Effective class discussion | Assignments<br>Activities during lectures (class room participation) |
| 1.3 | Understand how different functional groups affect the Physical, acidity and basicity properties of the molecules for carboxylic acids, amines, alcohols, Phenol and other functional groups. | K3 | Traditional lectures<br>Working in groups Exercises during the class<br>Brain storming<br>Homework's assignments<br>Effective class discussion | Written examinations<br>Quizzes<br>Assignments<br>Activities during lectures (class room participation) |
| **2.0** | **Skills** | | | |
| 2.1 | Predict and differentiate structures, name, and reactivity of different organic compounds based on their functional group | S1 | Working in groups<br>Brain storming<br>Exercises during the class Effective class discussion | Activities during lectures<br>Written examinations<br>quizzes<br>Practical test<br>assignments |
| 2.2 | Prepare and detection of Organic compounds based on their functional group | S2 | Traditional lectures<br>Group work with presentation<br>Practical work | Written examinations<br>Practical test<br>Laboratory reports<br>assignments |
| ... | | | | |
| **3.0** | **Values, autonomy, and responsibility** | | | |
| 3.1 | Ability to work independently to | V1 | Practical work | Laboratory |

| Code | Course Learning Outcomes | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| | handle chemicals | | | reports<br>Assignments<br>Activities during lectures (class room participation) |
| 3.2 | Ability to work in a team to perform a specific experimental task | V3 | Practical work<br>Working in groups | Laboratory reports<br>Assignments |
| ... | | | | |

## C. Course Content

| No | List of Topics | Contact Hours |
|---|---|---|
| | **I- Theoretical Part** | |
| 1. | Introduction of organic molecules( structure, properties, classification types of the reactions, type of the bonds, geometry and hybridization , electronic effect | 2 |
| 2. | Nomenclature of organic compounds | 2 |
| 3. | Preparation, physical properties, chemical reactions of Hydrocarbons (alkanes I) | 2 |
| 4. | Preparation, physical properties, chemical reactions of Hydrocarbons (alkanes II) | 2 |
| 5. | Preparation, physical properties, chemical reactions of Hydrocarbons (alkenes I) | 2 |
| 6. | Preparation, physical properties, chemical reactions of Hydrocarbons (alkenes II) | |
| 7. | Preparation, physical properties, chemical reactions of Hydrocarbons (alkynes I) | 2 |
| 8. | Preparation, physical properties, chemical reactions of Organic halides | 2 |
| 9. | Midterm Exam | 2 |
| 10. | Preparation, physical properties, chemical reactions of Alcohols | 2 |
| 11. | Preparation, physical properties, chemical reactions Ethers | 2 |
| 12. | Preparation, physical properties, chemical reactions of Aldehydes and Ketones (I) | 2 |
| 13. | Preparation, physical properties, chemical reactions of Aldehydes and Ketones (II) | 2 |
| 14. | Preparation, physical properties, chemical reactions of carboxylic acid compounds and their derivatives | 2 |

| | | |
|---|---|---|
| 15. | Preparation, physical properties, chemical reactions of Amines and organic sulfide compounds | 2 |
| | **II- Experiment part** | |
| 1. | Procedures security and safety in the laboratory | 2 |
| 2. | Identification of Hydrocarbons I | 2 |
| 3. | Identification of Hydrocarbons II | 2 |
| 4. | Identification of Hydrocarbons III | 2 |
| 5. | Identification of Alcohols I | 2 |
| 6. | Identification of Alcohols II | 2 |
| 7. | Identification of Alcohols III | 2 |
| 8. | Midterm Exam | 2 |
| 9. | Identification of Phenols I | 2 |
| 10. | Identification of Phenols II | 2 |
| 11. | Identification of Aldehyde and Ketones I | 2 |
| 12. | Identification of Aldehyde and Ketones II | 2 |
| 13. | Identification of organic acids and their derivatives | 2 |
| 14. | Identification of amine and their derivatives | 2 |
| 15 | Final Exam | 2 |
| **Total** | | **60** |

## D. Students Assessment Activities

| No | Assessment Activities * | | Assessment timing (in week no) | Percentage of Total Assessment Score |
|---|---|---|---|---|
| 1. | Oral discussions and questions | | During semester | 5% |
| 2. | Quizzes | | During semester | 10% |
| 3. | Mid-Term Exam | | 9 | 20% |
| 4 | Practical exam | Reports and activities | 11 | 15% |
| | | final | | 10% |
| 5 | Final Exam | | 12 | 40% |

*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, Robert T. Morrison and Robert N. Boyd, PRENTICE-HALL INTERNATIONAL, INC., London. Edition** |

| | |
|---|---|
| | 6,Allyn and Bacon, Inc. 7 wells Avenue, Newton, Massachusetts 02159.<br>• Organic Chemistry, Volume I, IL Finar, Sixth Edition, 2009, Dorling Kindersley Pvt. Ltd. |
| **Supportive References** | Principles Of Organic Chemistry, Robert J. Ouellette, 2015, ISBN: 978-9351073185 |
| **Electronic Materials** | http://www.organicdivision.org/?nd=p_organic_web_links<br>http://www.siencedirect.com<br>http://sdl.edu.sa/SDLPortal/AR/Publishers.aspx |
| **Other Learning Materials** | Tetrahedron Letters<br>Arabian Journal of Chemistry<br>Journal of heterocyclic chemistry<br>European journal of Chemistry |

## 2. Required Facilities and equipment

| Items | Resources |
|---|---|
| **facilities**<br>(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Traditional classroom; Classrooms with 25 seats |
| **Technology equipment**<br>(projector, smart board, software) | Multimedia projector, smart board |
| **Other equipment**<br>(depending on the nature of the specialty) | Molecular Models |

## F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---|---|
| Effectiveness of teaching | Faculty | Direct (reports) |
| Effectiveness of Students assessment | Students and faculty | Direct and Indirect (reports and surveys) |
| Quality of learning resources | Peer Reviewer, students | Indirect (surveys) |
| The extent to which CLOs have been achieved | Peer Reviewer, students | Direct and Indirect (reports and surveys) |
| Other | | |

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

Assessment Methods (Direct, Indirect)

## G. Specification Approval

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|---|---|
| **COUNCIL /COMMITTEE** | **CHEMISTRY DEPARTMENT COUNCIL NO. (9)** |
| **REFERENCE NO.** | **20285, ADOPTED ON DATE, 01/05/1445** |
| **DATE** | **HELD ON WEDNESDAY, 01/05/1445** |