
COURSE Syllabus

**Course Name: Chemistry of
Heterocyclic Compounds**

Course Number: 101413

General Course Information:

Course title	Chemistry of Heterocyclic Compounds
Course number	1101413
Credit hours (theory, practical)	3
Contact hours (theory, practical)	12- 1
Prerequisites/corequisites	1101212
Academic Program	Bachelor
Programcode	01
Awarding institution	Al-Isra university
Faculty	Science
Department	Chemistry
Level of course	3rd year
Academic year /semester	2019/2020- 2nd semester
Awarded qualification	Bachelor degree in chemistry
Other department(s) involved in teaching the course	-
Language of instruction	English
Date of production/revision	

Course Coordinator:

Coordinator's Name: Dr. Samer E. Al-Waideh

Office No.:

Office Phone:

Office Hours: 10-11 Sunday & Monday, 11-12 Tuesday & Wednesday, 1-2 Thursday.

Email: samerawaideh@yahoo.com,

Course Description:

Fundamental principles in heterocyclic chemistry. Synthesis and reactivity of major classes of heterocyclic compounds are covered in detail. Special attention is given to heterocycles of biological interest and the importance of heterocycles in pharmaceutical industry.

Text Book: Author(s), Title, Publisher, Edition, Year, Book website.

1- Heterocyclic Chemistry: Gilchrist, 3rd Ed., 1997.

References: Author(s), Title, Publisher, Edition, Year, Book website.

2- The Chemistry of Heterocycles, Eicher and Hauptmann, 3rd Ed., 2013.
--

Course Educational Objectives (CEOs):

1.	Study the modern methods in heterocyclic chemistry with focus on the importance of heterocycles in biological systems and pharmaceutical industry
2.	Study the major classes of heterocyclic compounds and their chemical properties.
3.	Ability of students to predict reactivity of different classes of heterocycles.
4.	Study the commonly used synthetic routes of heterocyclic compounds.
5.	Ability of students to plan synthetic routes to complex organic molecules containing heterocyclic motifs.
6.	Study general synthetic approaches used in drug discovery and synthetic routes to major drugs containing heterocyclic motifs.

Intended Learning Outcomes (ILO's):

	Intended Learning Outcomes (ILO's)	Relationship to CEOs	Contribution to PLOs
A	Knowledge and Understanding:		
A1	Student should be able to use the rules of naming in naming the heterocyclic compounds.	1	A
A2	Student should be able to understanding the classification of heterocyclic compounds.	2 & 3	a & c
A3	Student should e able to understanding physical and chemical properties of heterocyclic compounds.	5	C
B	Intellectual skills:		
B1	Student should be able to all possible resonance structures and its relationship with physical properties	2 & 3	D
B2	Student should be able to use the equivalent resonance structure to determine the reactivity in both nucliophelic and electrophelic reactions.	2 & 3	D
B3	Students should be able to use the chemical properties of heterocyclic compounds in synthesis of its derivatives.	4	D
B4	Student should be able explain the mechanisms of all synthesis and chemical reactions.	6	D
C	Subject specific skills:		
C1			

D	Transferable skills:		
D1			
D2			

Topic Outline and Schedule:

Topic	Weeks	Achieved ILOs
Chapter 1: Heterocyclic Nomenclature 5-Membered heterocycles, 1 heteroatom: Pyrroles/Furans/Thiophenes.	1	A1, A2, & B1
Chapter 2: Benzofused 5-membered heterocycles, 1 heteroatom: Indoles/Benzofurans/Benzothiophenes	4	A1, A2, & B1
Chapter 3: 6-Membered heterocycles, 1 heteroatom: Pyridines	7	A2&B4
Chapter 4: 6-Membered heterocycles, 1 heteroatom: Pyridines/Quinolines/Isoquinolines	9	B3
Chapter 5: 5-Membered heterocycles, 2 heteroatoms: 1,2-Azoles/1,3-Azoles	11	A3 A1
Chapter 6: 6-Membered heterocycles, 2 heteroatoms: Diazines, Pyrylium/Pyrones	13	
Chapter 7: Saturated and partially unsaturated heterocyclic compounds	14	A3, B3& B4
Chapter 8: 3-Membered heterocycles, 1 heteroatom: aziridines, epoxides	15	A3, B3& B4

Final exam	16	
-------------------	----	--

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Lectures

Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

First Exam and second exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.

F- Available university services that support achievement in the course: **Labs, Library.**

Required equipment:

Assessment Tools implemented in the course:

- ✓ First Written Exam.
- ✓ Second Written Exam.
- ✓ Final Written Exam.
- ✓ Quizzes.
- ✓ Homework.
- ☐ Integrative Projects.
- ☐ Case Study.
- ☐ Written Reports.
- ✓ Participation in Lecture.
- ☐ Practice in the Lab.
- ☐ Illustrative Presentations.
- ☐ Oral Exams.
- ☐ Others (identify):

Program Learning Outcome (PLOs):

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the () program will demonstrate	
a.	Describe the fundamental scientific principles and theories across the four subfields of chemistry (Organic, inorganic, analytical and physical).
b.	Identify and confirm chemical compounds structures as well as determine chemical composition.
c.	Establish and concludes mechanisms of physical and chemical processes in addition to the ability of mastering qualitative and quantitative determination.
d.	Solve the scientific problems using different mechanisms and procedures based on critical thinking.
e.	Conduct scientific experiments in chemistry.
f.	Commitment and interest in lifelong learning, and collaborate effectively with other people in a team.
g.	Prepare logical, organized and concise written reports, and oral and poster presentations that effectively communicate chemical content to other scientists.
h.	Commitment to the ethical principles of chemical research.
i.	Find information about chemistry through databases and information
j.	Evaluation of calculations in chemistry experiments and information analysis using computer software.
k.	Demonstrate safety laboratory techniques.

Responsible Persons and their Signatures:

Course Coordinator	Dr. Samer E'layan Al-Awaideh	Completed Date	9/10/2019
		Signature	
Received by (Department Head)	Dr. Alaa Mahmoud Al-Ma'abreh	Received Date	10/10/2019
		Signature	