



Course Specifications

Course Title:	Heterocyclic Chemistry
Course Code:	511CHEM-2
Program:	Master of Science in Chemistry
Department:	Chemistry
College:	Science
Institution:	King Khalid University

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A. Course Identification

1. Credit hours: 2
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: Level 1/Year1
4. Pre-requisites for this course (if any): No Pre-requisites
5. Co-requisites for this course (if any): No Co-requisites

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	1.5	75%
2	Blended	0	0
3	E-learning	0.5	25%
4	Correspondence	0	0
5	Other	0	0%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	20
2	Laboratory/Studio	0
3	Tutorial	10
4	Others	0
	Total	30
Other Learning Hours*		
1	Study	20
2	Assignments	15
3	Library	10
4	Projects/Research Essays/Theses	15
5	Others (specify) (Presentation and report discussion)	20
	Total	80

* 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

This course is designed to cover the basic principles of some classes of heterocyclic organic compounds, involving nomenclature, synthesis, reactivity towards electrophilic and nucleophilic reagents and their applications.



2. Course Main Objective

The main objectives of this course are to demonstrate to student to systematic nomenclature for different classes of heterocyclic organic compounds and their fused derivatives, the methods of preparation and the reactions of these compounds with electrophilic and nucleophilic reagents. The course also aims to teach students how to suggest and write the mechanisms of the reactions used to prepare heterocyclic organic compounds or that occur during electrophilic or nucleophilic reactions of these compounds.

3. Course Learning Outcomes

CLOs		Aligned-PLOs
1	Knowledge:	
1.1	To recognize the correct method of nomenclature of different classes of heterocyclic compounds and their fused ring derivatives.	K1
1.2	To state the properties of the heterocyclic compounds with different ring sizes (Three, Four, Five, Six and Seven-membered rings) and their fused ring derivatives.	K1, K3
1.3	To know students the importance of knowing the ways to prepare these compounds	K1
2	Skills:	
2.1	To design different types of heterocyclic compounds.	S2, S3
2.2	To explain different methods of preparation of heterocyclic compounds and how to convert them to other heterocycles.	S1
3	Competence:	
3.1	To perform the ethics of dealing with their colleagues and with the lecturer.	C1
3.2	To demonstrate full responsibility toward themselves and toward others.	C5

C. Course Content

No	List of Topics	Contact Hours
1	Nomenclature of heterocyclic and fused heterocyclic compounds.	7
2	Chemistry of three, and four-membered heterocycles (structure, synthesis, and chemical reactions)	5
3	Chemistry of five-membered heterocycles which contains one or two hetero-atoms and their benzo-derivatives (structure, synthesis and reactions)	9
4	Chemistry of six-membered heterocycles which contains one or two heteroatoms and their benzo-derivatives (structure, synthesis and chemical reactions)	9
Total		30



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	To recognize the correct method of nomenclature of different classes of heterocyclic compounds and their fused ring derivatives.	<ul style="list-style-type: none"> • Lectures • Classroom discussion • Case study 	<ul style="list-style-type: none"> • Homework • Assignments • Examinations
1.2	To state the properties of the heterocyclic compounds with different ring sizes (Three, Four, Five, Six and Seven-membered rings) and their fused ring derivatives.		
1.3	To outline the importance of the ways of preparing heterocyclic compounds		
2.0	Skills		
2.1	To design different types of heterocyclic compounds.	<ul style="list-style-type: none"> • Lectures • Classroom discussion • Case study 	<ul style="list-style-type: none"> • Written exams • Oral discussion
2.2	To explain different methods of preparation of heterocyclic compounds and how to convert them to other heterocycles.		
3.0	Competence		
3.1	To illustrate the ethics of dealing with their colleagues and with the lecturer.	<ul style="list-style-type: none"> • Lectures • Classroom discussion • Case study 	<ul style="list-style-type: none"> • Class activities • Oral presentation for students reports • Oral discussion
3.2	To demonstrate full responsibility toward themselves and toward others.		

2. Assessment Tasks for Students

#	*Assessment task	Week Due	Percentage of Total Assessment Score
1	1 st semi-semester	6 th	15
2	2 nd semi-semester	12 th	15
3	Homework assignments	3 rd , 5 th and 7 th	10
4	Reports and Oral Discussion	8 th , 9 th and 11 th	10
5	Final Written exam	15 th	50

*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:

- 10 office hours are offered for students for individual consultations.
- Communications are available on-site, phone conversations, and chatting by social media.



F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	A. R. Katritzky, A. F. Pozharski, Handbook of Heterocyclic Chemistry, Pergamon, 2nd Ed., 2000. J. A. Joule & K. Mills, Heterocyclic Chemistry, Wiley & Sons., New York, 5th ed., 2010.
Essential References Materials	T. Eicher, S. Hauptmann, The Chemistry of Heterocycles-structure, reactions, syntheses, and application, Wiley & Sons, 2nd ed., 2008.
Electronic Materials	http://www.chemguide.co.uk/mechanisms/freerad/whatis.html#top
Other Learning Materials	Chemdraw Professional, ISIS Draw and Chemsktch Programs for drawing structures for heterocyclic compounds.

2. Facilities Required

Item	Resources
Accommodation Classrooms, laboratories, demonstration) (rooms/labs, etc)	<ul style="list-style-type: none"> Classroom and computer lab
Technology Resources (.AV, data show, Smart Board, software, etc)	<ul style="list-style-type: none"> Data Show. Smart board. Chem draw program. ISIS draw program. Internet access. Accessible databases
Other Resources Specify, e.g. if specific laboratory) equipment is required, list requirements or (attach a list	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course delivery (teaching methods and assessment methods)	Departmental Plan and curriculum committee; external reviewers	Reports and workshops
	Program Leader	Meetings
Course contents (update).	Departmental Plan and curriculum committee; external reviewers	Reports and workshops
Quality of learning resources	External reviewers	Reports



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	Chemistry Department Council
Reference No.	Session number 22
Date	27/04/2021M / 15/09/1442H

