



**ATTACHMENT 2 (e)**

**Course Specifications**

**Kingdom of Saudi Arabia**

**The National Commission for Academic Accreditation & Assessment**

# **Heterocyclic Chemistry**

**4023556-3**

**Course Specifications  
(CS)**





## Course Specifications

Institution: <b>Umm Al-Qura University</b>	Date of Report: <b>2017</b>
College/Department : <b>Faculty of Applied Science/ Department of Chemistry</b>	

### A. Course Identification and General Information

1. Course title and code: <b>Heterocyclic Chemistry /4023556-3</b>	
2. Credit hours: <b>3 hrs (2 theoretical + 1 practical)</b>	
3. Program(s) in which the course is offered: <b>Chemistry and Industrial Chemistry</b>	
4. Name of faculty member responsible for the course: <b>Dr. Rasha El-Demerdash El-Mekawi</b>	
5. Level/year at which this course is offered: <b>5<sup>th</sup> level/3 year (1<sup>st</sup> term)</b>	
6. Pre-requisites for this course (if any): <b>Chemistry of aromatic compounds (4022142-3)</b>	
7. Co-requisites for this course (if any): <b>Chemistry of Organic Reactions and Preparation (4023565-3)</b>	
8. Location if not on main campus: <b>both on El-Abdyah and El-Zaher</b>	
9. Mode of Instruction (mark all that apply)	
a. Traditional classroom	<input type="checkbox"/> What percentage? <input type="checkbox"/>
b. Blended (traditional and online)	<input checked="" type="checkbox"/> What percentage? <b>90 %</b>
c. e-learning	<input checked="" type="checkbox"/> What percentage? <b>10 %</b>
d. Correspondence	<input type="checkbox"/> What percentage? <input type="checkbox"/>
f. Other	<input type="checkbox"/> What percentage? <input type="checkbox"/>
Comments:	

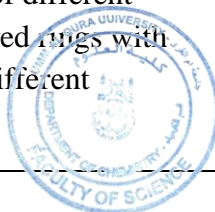


## B Objectives

1. What is the main purpose for this course? <input checked="" type="checkbox"/> <b>By the end of this course student will be familiar with Studying trivial and systematic nomenclature, chemical properties and synthesis of different heterocyclic compounds.</b>
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) <input checked="" type="checkbox"/> <b>The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course</b>

**C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)**

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
a- Classification of heterocyclic compounds	1	2
b- Nomenclature of monocyclic heterocyclic compounds as well as fused systems	2	4
c- Bonding, Structure and geometry in heterocyclic compounds: three, four, five and six membered heterocycles- Aromaticity – Basicity	2	4
d- Structure and reactivity of different heterocycles five and six-membered rings with one or more different heteroatoms (same or different heteroatoms).	2	4
e- Chemical reactions of different heterocyclic compounds five and six-membered rings with one or more different heteroatoms (same or different heteroatoms).	2	4
f- Cycloaddition reactions (Diels-Alder [2+4]) of different heterocyclic compounds five and six-membered rings with one or more different heteroatoms (same or different heteroatoms).	1	2





g- Synthetic Routes to five membered rings with one or more different heteroatoms (same or different heteroatoms).	1	2
h- Synthetic Routes to six membered rings and fused heterocycles with one heteroatom.	1	2
i- Synthetic Routes to six membered rings with two heteroatoms (Diazines) (pyrimidine and pyrazine)	1	2

### Laboratory Part:

- 1- Identifying the protocol of security and safety in lab. and developing of the environmental awareness
- 2- Synthesis of phthalimide
- 3- Synthesis of phthalalylglycine
- 4- Synthesis of benzimidazole
- 5- Synthesis of benzotriazole
- 6- Synthesis of 1, 2, 3, 4-tetrahydrocarbazole
- 7- Synthesis of 3-methyl-1-phenyl-5-pyrazolone
- 8- Synthesis of 7-hydroxy-4-methyl coumarin
- 9- Synthesis of 3, 4-dihydro-1-hydroxy-4-oxo phthalazine
- 10- Synthesis of 4-benzylidene-2-methyloxazol-5-one
- 11- Synthesis of 5, 5-diphenyl hydantoin
- 12- Synthesis of 2, 4, 5-triphenyl oxazole



2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	26	-	36			62
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	<b>NQF Learning Domains And Course Learning Outcomes</b>	<b>Course Teaching</b>	<b>Course Assessment</b>
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		Strategies	Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	Studying the molecular structures of different heterocyclic compounds	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Scientific discussion</li> <li>• Library visits</li> <li>• Web-based study</li> <li>• E-learning</li> </ul>	<ul style="list-style-type: none"> <li>• Exams</li> <li>• web-based student performance systems</li> <li>• portfolios</li> <li>• long and short essays</li> <li>• posters lab manuals</li> <li>• Homework</li> <li>• Periodic Short exams</li> </ul>
1.2	Describing the classification of heterocyclic compounds according to their different types		
1.3	Knowledge of different methods for nomenclature of heterocyclic compounds		
1.4	Showing the multiple methods of preparation of heterocyclic compounds		
1.5	Recognizing the chemical properties of heterocyclic compounds		
1.6	Identifying the chemical reactions of different heterocyclic compounds		
<b>2.0</b>	<b>Cognitive Skills</b>		
2.1	Development of reverse thinking skill (back thinking) and the student's acquiring the training skill to choose the suitable method for heterocyclic compounds preparation	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Scientific discussion</li> <li>• Library visits</li> <li>• Web-based study</li> </ul>	<ul style="list-style-type: none"> <li>• Exams</li> <li>• web-based student performance systems</li> <li>• portfolios</li> <li>• posters</li> <li>• demonstrations</li> </ul>
2.2	Making the student acquire the skill of naming heterocyclic compounds		
2.3	The student's acquiring of the skill of how to predict the outcomes of interactions of heterocyclic compounds		
2.4	The student can pick the appropriate methods for the preparation of heterocyclic compounds		
2.5	Design of different ways to nomenclature the heterocyclic compounds		
2.6	Student invents different ideas for the construction of many of the heterocyclic compounds		
2.7	The student is planning to make a research programme in the field of chemistry of heterocyclic compounds and their effectiveness		
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
	<ul style="list-style-type: none"> <li>• Ability to work in a team to perform a specific experimental tasks.</li> <li>• Ability to work independently to handle chemicals</li> <li>• Ability to communicate results of work to classmate and participation in class or laboratory discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Class discussions</li> <li>• Research activities</li> </ul>	<ul style="list-style-type: none"> <li>• Performance on in-practical exams.</li> <li>• Work on research activity.</li> </ul>



			<ul style="list-style-type: none"> <li>• Overall student performance in Lab. discussions</li> <li>• Cross questions after finishing laboratory work</li> </ul>
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	The ability to conduct a successful style of dealing with data analysis, describing his strategy in the image and draw conclusions from them	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Scientific discussion</li> <li>• Library visits</li> <li>• Web-based study</li> </ul>	<ul style="list-style-type: none"> <li>• web-based student performance systems</li> <li>• individual and group presentations</li> </ul>
4.2	Introductory lecture at the beginning of the semester to use the computer and the internet to search for sources of new researches and collect the researches which help in writing reports on topics related to syllabus.		
4.3	Evaluating the performance of the students through examination, duties and the discussion in the lecture which constitute 30 % of the total evaluation.		
<b>5.0</b>	<b>Psychomotor</b>		
	Not Applicable		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	<b>Midterm Exam</b>	<b>5-14</b>	<b>20%</b>
2	<b>Assignments (Homework + Activities+ Attendance +periodic short exams)</b>		<b>10 %</b>
3	<b>Practical Exam</b>	<b>15</b>	<b>30%</b>



4	Final Exam.(2 hours exam)	16	40%
5	<b>Total</b>	<b>100 %</b>	

#### D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

#### E. Learning Resources

##### 1. List Required Textbooks

- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1<sup>st</sup> Ed., published: 1<sup>st</sup> June, Vol. 126, 2018. **Hardcover ISBN: 9780128152096, Imprint: Academic Press. Elsevier**
- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1<sup>st</sup> Ed., published: 3<sup>rd</sup> February, Vol. 125, 2018. **ardcover ISBN: 9780128152102, Imprint: Academic Press. Elsevier.**
- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1<sup>st</sup> Ed., published: 4<sup>th</sup> January, Vol. 124, 2018. **E-Book ISBN: 9780128137611, Hardcover ISBN: 9780128137604, Imprint: Academic Press, Elsevier**
- Gordon Gribble, John Joule "Progress in heterocyclic Chemistry" 1<sup>st</sup> Ed., Published: 5<sup>th</sup> September, Vol. 29, 2017. **E-Book ISBN: 9780081023112, Hardcover ISBN: 9780081023105, Imprint: Elsevier**
- Alan R. Katritzky, Christopher A. Ramsden, John A. Joule "Advances in heterocyclic Chemistry" 1<sup>st</sup> Ed., Published 7 Novmber, Vol. 113, 2014. **ISBN 10 0080958435, ISBN 13 9780080958439, Imprint: Elsevier / The Lancet**

##### 2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

##### 3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)



- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1<sup>st</sup> Ed., published: 4<sup>th</sup> April, Vol. 123, 2017. **E-Book ISBN:** 9780128121955, **Hardcover ISBN:** 9780128120927, **Imprint:** Academic Press, Elsevier.
- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1<sup>st</sup> Ed, published: 25<sup>th</sup> March, Vol. 122, 2017. **E-Book ISBN:** 9780128119938, **Hardcover ISBN:** 9780128119730, **Imprint:** Academic Press Elsevier.
- Eric Scriven, Christopher A. Ramsden " Heterocyclic Chemistry in the 21<sup>st</sup> century: A Tribute to Alan R. Katritzky" 1<sup>st</sup> Ed., Published: 4<sup>th</sup> January Vol. 121, 2017. **E-Book ISBN:** 9780128120705, **Hardcover ISBN:** 9780128111741, **Imprint:** Academic Press
- Gordon Gribble, John Joule "Progress in heterocyclic Chemistry" 1<sup>st</sup> Ed., Published: 3<sup>rd</sup> September, Vol. 28, 2016. **E-Book ISBN:** 9780080994093, **Hardcover ISBN:** 9780080994062, **Imprint:** Elsevier

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- <http://www.chemweb.com>
- <http://www.sciencedirect.com>
- <http://www.rsc.org>

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

## F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**





## G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Complete the questionnaire evaluation of the course in particular.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor <ul style="list-style-type: none"><li>• <b>Observations and the assistance of colleagues.</b></li><li>• <b>Independent evaluation for extent to achieve students the standards.</b></li><li>• <b>Independent advice of the duties and tasks.</b></li></ul>
3 Processes for Improvement of Teaching <ul style="list-style-type: none"><li>• <b>Workshops for teaching methods.</b></li><li>• <b>Continuous training of member staff.</b></li><li>• <b>Review of strategies proposed.</b></li><li>• <b>Providing new tools for learning.</b></li><li>• <b>The application of e-learning.</b></li><li>• <b>Eexchange of experiences internal and external.</b></li></ul>
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) <ul style="list-style-type: none"><li>▪ <b>Check marking of a sample of exam papers, or student work.</b></li><li>▪ <b>Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.</b></li></ul>
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. <ul style="list-style-type: none"><li>• <b>Periodic Review of the contents of the syllabus and modify the negatives.</b></li><li>• <b>Consult other staff of the course.</b></li><li>• <b>Hosting a visiting staff to evaluate of the course.</b></li><li>• <b>Workshops for teachers of the course.</b></li></ul>



**Faculty or Teaching Staff: Dr/ Rasha El-Mekawy**

**Signature:** 

**Date Report Completed: 12/1/2019**

**Received by: Dr Ismail I. Althagafi Department Head**

**Signature:** 

**Date: 20/1/2019**

