



**ATTACHMENT 2 (e)**

**Course Specifications**

**Kingdom of Saudi Arabia**

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

# **Organic analytical chemistry**

**4022145-3**





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>Organic Analytical Chemistry/4022145-3</b>			
2. Credit hours: <b>3 hrs</b> (2 theoretical + 1 practical ).			
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>Prof. Amr L Saber</b>			
5. Level/year at which this course is offered: <b>4<sup>th</sup> level / 2<sup>rd</sup> year</b>			
6. Pre-requisites for this course (if any): <b>Volumetric Analysis Chemistry</b>			
7. Co-requisites for this course (if any)---			
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 checked="" type="checkbox"/>	What percentage?	<b>100%</b>
b. Blended (traditional and online)	<input type="checkbox"/>	What percentage?	
c. e-learning	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
f. Other	<input type="checkbox"/>	What percentage?	
Comments:			



## B Objectives

<p>1. What is the main purpose for this course?</p> <p>1.1. Demonstration analytical methods which include the analysis of organic compounds</p> <p>1.2. Know the different function groups in organic compounds</p> <p>1.3. Determination of the state of unsaturation in organic compounds</p> <p>1.4. Stress the different analytical methods to determine organic compounds in real samples</p> <p>1.5. Recognize the formation method of oxime</p>
<p>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)</p> <p><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></p>

**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
1. Determination of elements in organic compounds	2	4
2. Determination of Carboxylic acids	1	2
3. Determination of esters	1	2
4. Determination of amino groups	1	2
5. Determination of hydroxylic groups	1	2
6. Determination of carbonyl groups and their derivatives	2	4
7. Determination of nitro and nitroso groups	1	2
8. Determination of the state of unsaturation in organic compounds	1	2
9. Determination of organic peroxide	1	2
10. Determination of isothiocyanate and isocyanate	1	2
11. Discussion the formation method of oxime (equilibrium and kinetic study) as a model in organic analytical chemistry	2	4

### Laboratory Part:

- Determination of elements(C, H, O, N,...) in organic compounds.
- Determination of formaldehyde concentrations in their solutions
- Determination of acetone concentrations in their solutions
- Determination of amino and hydroxyl groups
- Determination of equivalent weight for carboxylic acid
- Determination of the strength of aniline solution
- Determination of reduced saccharide
- Determination of the equivalence of ester saponification
- Determination of amino-acids





2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week.	2 h
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy
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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	<b>Knowledge</b>		
1.1	Recognize principles of organic analysis in analytical chemistry.	<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>• long and short essays</li> <li>• posters lab manuals</li> </ul>
1.2	Identify the classification of organic analysis methods		
1.3	Know the procedures of elemental analysis		
1.4	Define the concentration parameters		
1.5	Recognize the meaning of equivalent weight and saponification		
1.6	Describe statistical methods in organic analysis.		
1.7	Select the proper method to determine the strength of aniline solution		
1.8	Demonstrate the state of unsaturation in organic compounds		
1.9	Recognize the formation method of oxime (equilibrium and kinetic study) as a model in organic analytical chemistry		
1.10	Outline application important		
2.0	<b>Cognitive Skills</b>		
2.1	Apply the suitable methods for elemental analysis	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Scientific discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Exams</li> <li>• web-based student performance systems</li> </ul>
2.2	Compare the different types of hetero-organic compounds analysis		



2.3	Explain principles of organic analysis methods and its classification	<ul style="list-style-type: none"> <li>Library visits</li> <li>Web-based study</li> </ul>	<ul style="list-style-type: none"> <li>portfolios</li> <li>posters</li> <li>demonstrations</li> </ul>
2.4	Analyze deferent amino-acids compounds		
2.5	Summarize the principles of organic analysis		
3.0	<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> <li>Overall student performance in Lab. discussions</li> <li>Cross questions after finishing laboratory work</li> </ul>
4.0	<b>Communication, Information Technology, Numerical</b>		
	<ul style="list-style-type: none"> <li>Use information and communication technology.</li> <li>Scientific writing.</li> <li>Use his/her observations to solve problems.</li> <li>Doing research and conduct searches for restoring information.</li> <li>Able to calculate and discuss the facts and logical propose methods to solve the difficulties.</li> </ul>	<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>
5.0	<b>Psychomotor</b>		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

#### 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
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1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam. (2hours 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

- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, *Analytical Chemistry*, 7th edition, Springer (2014)

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)

- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, *Analytical Chemistry*, 7th edition, WILEY (2014)
- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, *Analytical Chemistry*, 7th edition, Springer (2014)
- Dhruva Charan Dash. *Analytical Chemistry* (2017) PHI Learning Private Limited.

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.)



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|---|
| 1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) <ul style="list-style-type: none"><li>• <b>Classrooms capacity (30) students.</b></li><li>• <b>Providing hall of teaching aids including computers and projector.</b></li></ul> |
| 2. Computing resources (AV, data show, Smart Board, software, etc.) <ul style="list-style-type: none"><li>▪ <b>Room equipped with computer and projector and TV.</b></li></ul>  |
| 3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) <ul style="list-style-type: none"><li>• <b>No other requirements.</b></li></ul>   |

### G Course Evaluation and Improvement Processes

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|---|
| 1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching<br>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>Exchange 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></ul>   |



- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.

Faculty or Teaching Staff: Prof. Amr L Saber

Signature:

Date Report Completed: 12/1/2019

Received by: Dr. Ismail Althagafi

Department Head

Signature:

Date: 20/1/2019

