



Course Specifications

Course Title:	Quantitative Organic Analysis
Course Code:	363CHEM-2
Program:	Bachelor 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 6/ Year 3
4. Pre-requisites for this course (if any): 213Chem-4
5. Co-requisites for this course (if any): No co-requisite

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	100 %
2	Blended	0	0 %
3	E-learning	0	0 %
4	Correspondence	0	0 %
5	Other	0	0 %

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	0
2	Laboratory/Studio	60
3	Tutorial	0
4	Others (specify)	0
	Total	60
Other Learning Hours*		
1	Study	40
2	Assignments	10
3	Library	0
4	Projects/Research Essays/Theses	10
5	Others (specify)	0
	Total	60

* 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 introduces the essential principles for Estimation of functional groups in various organic compounds analyzed quantitative assays using either direct or back titration after conducting a chemical reaction either volumetric analysis or gravimetric analysis.

2. Course Main Objective

The main purpose of this course is to demonstrate to students the principles to learn the skill of the installation of the equipment and tools needed for the estimation of organic compounds. After teaching of that course the students will able to:

- Learn how to quantification of organic compounds with different function groups.
- Learn the skill of the installation of the equipment and tools needed for the preparation of organic compounds.
- Learn a skill to identify the degree of purity of the solid organic compound.
- Teach students how to purify organic compounds.
- Learn how to prepare solution.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	To learn how to use the burette to hold calibration and conduct background calibration.	K1, K3
1.2	To learn the skill of using a calculator and compensation laws.	K1, K3
2	Skills:	
2.1	To learn Scientific skills, practical skills, research and math skills.	S1, S3
2.2	To teaching students the ability to overcome the problems they face while estimating the functional groups of organic compounds. To teach students the ability to follow up the progress of chemical reactions and determine the end point of the calibration reactions. To teach students the ability to calculate the proportion and number of function groups in the compound, as well as how to calculate the degree of purity of some organic compounds.	S1, S4
2.3	To use basic glassware, equipment, and instrumentation for chemical experiments.	S1, S2, S3
3	Competence:	
3.1	To learn responsibility towards themselves and towards others.	C1, C2, C4
3.2	To learning ethics of dealing with his colleagues in the laboratory.	C1, C3
3.3	To use of communications technology and the search for information and view reports.	C3, C4
3.4	To use of computer programs like ChemDraw, ISIS/Draw.	C3, C5

C. Course Content

No	List of Topics	Contact Hours
1	*Introduction to the course and Safety in the laboratory. *Preparation of solution.	4
2	*Estimation of Hydroxyl Group in alcohols (determination of the percentage and the number Of alcoholic hydroxyl group). *Estimation of Hydroxyl Group in phenols (determination the number of phenolic groups).	4
3	*Estimation of amino group (determination of the percentage and the number of amino groups).	4
4	*Estimation of aliphatic and aromatic ester group (determination the percentage purity and saponification equivalent).	4

5	*Estimation of carboxylic group (determination the equivalent weight of an aliphatic and aromatic acids sample).	4
6	*Estimation of Acetyl group (determination the number and the ratio of acetyl groups).	4
7	*Estimation of sugars (determination the strength by Fehling method and determination of ratio of purity).	4
8	*Midterm Exam (practical and theoretical exams).	4
9	*Extraction of caffeine from tea and determination the percentage. *Extraction of casein from milk and determination the percentage.	4
10	*Estimation of carbonyl group (determination the percentage purity of the aldehyde sample by hydrazone formation method).	4
11	*Estimation of carbonyl group (determination the percentage purity of the ketone sample by hydrazone formation method).	4
12	*Estimation of carbonyl group (determination the percentage purity of the aldehyde sample of the aldehyde sample by sodium sulphite).	4
13	*Estimation of amino acids (determination the strength of a glycine sample by Sorensen formal titration).	4
14	*Estimation of amino acids (determination the ratio of the purity of a glycine sample by Sorensen formal titration).	4
15	*Final exam (practical and theoretical).	4
Total		60

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 learn how to use the burette to hold calibration and conduct background calibration.	* Lectures. * Laboratory experiments. * Classroom discussion.	* Quizzes. * Laboratory work and reports. * Classical examination.
1.2	To learn the skill of using a calculator and compensation laws.	* Classical lectures. * Problem solving. * Laboratory experiments. * Classroom discussion.	* Class testes. * Quizzes. * Laboratory work and reports. * Homework's. * Classical examination.
2.0	Skills		
2.1	To learn scientific skills, practical skills, research and math skills.	* Classical lectures. * Problem solving. * Classroom discussion. * Laboratory experiment	* Oral questions. * Class testes. * Quizzes. * Laboratory work and reports. * Homework's. * Classical examination.
2.2	To teaching students the ability to overcome the problems they face while estimating the functional groups of	* Classical lectures. * Problem solving.	* Oral questions. * Class testes.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	organic compounds. And To teach students the ability to follow up the progress of chemical reactions and determine the end point of the calibration reactions. And To teach students the ability to calculate the proportion and number of function groups in the compound, as well as how to calculate the degree of purity of some organic compounds.	* Classroom discussion. *Laboratory experiments.	* Quizzes. * Laboratory work and reports. * Homework's. *Classical examination.
2.3	To use basic glassware, equipment, and instrumentation for chemical experiments.	* Classical lectures. * Laboratory experiments.	* Class testes. * Laboratory work and reports. *Classical examination.
3.0	Competence		
3.1	To learn responsibility towards themselves and towards others.	* Team learning. *Tutorial *Personal work. *Classroom discussion.	*Oral questions. * Presentation. *Short answer questions.
3.2	To learning ethics of dealing with his colleagues in the laboratory.	* Team learning. *Tutorial *Personal work. *Classroom discussion.	*Oral questions. * Presentation. * Short answer questions.
3.3	To use of communications technology and the search for information and view reports.	* Team learning. *Tutorial *Personal work. *Classroom discussion.	*Class activities *presentation.
3.4	To use of computer programs like ChemDraw, ISIS/Draw.	* Classical lectures * Team learning * tutorial and personal work	*Class activities *presentation.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm theoretical exam	8 th	10%
2	Midterm practical exam	8 th	20%
3	Final theoretical exam	15 th	15%
4	Final practical exam	15 th	35%
5	evaluation	continuous	5%
6	Reports and quizzes	continuous	15%
	Total		100 %

*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	1- Miroslov Vecera, <i>Detection and Identification of Organic Compounds</i> , 2013. Springer Science & Business Media, 2012 2- Palleros, Daniel R. <i>Experimental organic chemistry</i> . Wiley & Sons, 2000. First edition.
Essential References Materials	1- John Leonard, Barry Lygo, Garry Procter. <i>Advanced Practical Organic Chemistry</i> , 2013. Third edition. 2- Most Clark F, <i>Experimental Organic Chemistry</i> , Wiley, 1988. 3- Durst, H. Dupont, and George W. Gokel. <i>Experimental Organic Chemistry</i> , McGraw-Hill Science, Engineering and Mathematics, 1986. Second edition.
Electronic Materials	1-Blackboard: E-Learning Deanship (http://elc.kku.edu.sa/). 2-YouTube. 3- www.orgsyn.org
Other Learning Materials	ISIS Draw, Chem Draw

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	*Organic Chemistry Laboratory. *Classroom and computer lab
Technology Resources (AV, data show, Smart Board, software, etc.)	*Accessible databases Endnote software package Authenticate software package *Smart board , software ex chemdraw
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Suction fans with high efficiency Magnetic stirrers with hotplate

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course delivery (teaching methods and assessment methods)	Students	Questionnaire
	Departmental Plan and curriculum committee; external reviewers	Reports and workshops
	Program Leader	Meetings
Course contents (update)	Departmental Plan and curriculum committee; external	Reports and workshops

Evaluation Areas/Issues	Evaluators	Evaluation Methods
	reviewers	
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	Department counsel
Reference No.	1/22/142
Date	15-9-1442