



# Course Specifications

<b>Course Title:</b>	Quantitative Analysis(2)
<b>Course Code:</b>	261CHEM-2
<b>Program:</b>	Bachelor of Science in Chemistry
<b>Department:</b>	Chemistry
<b>College:</b>	Science
<b>Institution:</b>	King Khalid University

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## A. Course Identification

<b>1. Credit hours:</b> 2
<b>2. Course type</b> <b>a.</b> University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/> <b>b.</b> Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> Level 4/ Year 3
<b>4. Pre-requisites for this course (if any):</b> 242CHEM
<b>5. Co-requisites for this course (if any):</b> None.

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	0	0
2	Blended	0	0
3	E-learning	0	0
4	Correspondence	0	0
5	Other (practical)	4	7.100

### 7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
<b>Contact Hours</b>		
1	Lecture	0
2	Laboratory/Studio	60
3	Tutorial	0
4	Others (specify)	0
	<b>Total</b>	60
<b>Other Learning Hours*</b>		
1	Study	20
2	Assignments	10
3	Library	0
4	Projects/Research Essays/Theses	0
5	Others (specify)	0
	<b>Total</b>	30

\* 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

Definition of solution and preparing different solution from solid primary standards and liquid secondary standard, ability of the students to prepare solutions and understanding the mathematical relations to calculate :weight,molarity,normality..etc. also the student to apply the principles of titrations and gravimetric analysis.

### 2. Course Main Objective

The main purpose of this course to understanding the students the principles of learning the skills of the installation of titrations and tools utilizing for preparation solutions from solid and liquids materials and how to calculate the percentage of purity in ore .

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge:</b>	
1.1	To classify the types of chemical analysis	K1&K3
1.2	To know the type of glassware which was using in preparing solutions .	
1.3	To learn the role of indicators in chemical reactions.	
1...		
<b>2</b>	<b>Skills :</b>	
2.1	To learn students the skills of application of Iodometric titration in some determinations.	S2&S3
2.2	To learn students the skills of application of complexometric titrations in determination water hardness	
2.3	To use basic glassware, equipment ,for chemical experiments	
<b>3</b>	<b>Competence:</b>	
3.1	To learn the students responsibility towards themselves and towards others	C1&C3
3.2	To use of computer programs like : Excel, Mathcad etc....	
3.3	To learn ethics of dealing with colleagues in laboratory	
3...		

## C. CourseContent

No	List of Topics	Contact Hours
1	Introduction to the chemical analysis and safety in the lab	4
2	Training the student how to prepare solution from solid and liquid substances	4
3	Determination of hydrochloric acid concentration titrated by standard sodium carbonate solution (neutralization titration)	4
4	Analysis of sodium hydroxide and sodium carbonate mixture by standard hydrochloric acid (salts hydrolysis)	4
5	Drawing the calibration curve of standardization titration and determine for endpoint.	4
6	Principles of Redox Titrations	4

	Determination of $\text{KMnO}_4$ concentration standardized by standard Oxalic acid(oxidation -reduction titration) .	4
7	Determination of sodiumthiosulphate concentration bypotassium dichromate solution (Iodometry)	4
8	Determination of Iodine concentration by standard sodium thiosulphate solution (Iodimetry)	4
9	Med term Exam (practical+theory)	4
10	Precipitation Titrations Determination of chloride concentration titrated by standard silvernitrate solution (More-Vigan- Volhard Methods) .	4
11	Complexometric titration Determination of water hardnessTitrated by standard disodium EDTAsolution	4
12	Determination of barium percentage in barium chloride	4
13	Determination of $\text{Fe}^{2+}$ concentration gravimetrically	4
14	Determination of $\text{Ca}^{2+}$ gravimetrically	4
<b>Total</b>		<b>60</b>

## D. Teaching andAssessment

### 1. AlignmentofCourseLearningOutcomeswithTeachingStrategiesandAssessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	To prepareprimary solutions and secondary solutions	Lectures Class room discussion Case study	Written report for each experiment oral and written examsduring the term testgoing during the practical lessons of the experiments and how to hold them dis
1.2	To learn the units of concentrations To avoid hazard chemical and solutions To teach hydrolysis of salts and discover the problems for examples when we titrate admixture sodium hydroxide and sodium bicarbonate with hydrochloric acid		
...			
<b>2.0</b>	<b>Skills</b>		
2.1	To learn Scientific skills ,practical skills ,research and math skills and to training the students how to solve problems facing them in chemical analysis.	Lectures Class room discussion Case study	Oral questions during experiment Quizzes
2.2	To teach students the ability to follow up the sequence of chemical reactions and determine the end point of the calibration reactions. To teach the students the ability of balancing equation and its effects on correct results of experiments	Lectures Class room discussion Case study	Using of most recent methods independency of students during performing his experiment
...			

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.0	<b>Competence</b>		
	<b>Course learning outcome</b>	<b>Teaching Strategies</b>	<b>To learn s</b>
3.1	To learn responsibility towards themselves and towards others	Asking students to write separate report for each experiment in each week	Oral questions during experiment Quizzes
3.2	To learn ethics of dealing with his colleagues in laboratory	Every student must be able to prepare his own solutions and chemicals required for his experiment	Class activities
3.3	To use of communications technology and search for information and view reports	Every student must be able to prepare his own solutions and chemicals required for his experiment	Class activities

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm theoretical exam	8	10%
2	Midterm practical exam	8	20%
3	Final theoretical exam	15	15%
4	Final practical exam	15	35%
5	Evaluation	continuous	5%
6	Reports and quizzes	continuous	15%
7			
8			

\*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 :

The faculty member has 10 hours per week for the students.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	Textbooks كتاب الكيمياء التحليلية ، التحليل الحجمي و الوزني . تأليف د. ابراهيم زامل الزامل ، د. محمد عبد العزيز الحجاجي و آخرون . الطبعة الثانية 1414 هـ (Arabic copy)
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<b>Essential References Materials</b>	الكيمياء العامة العملية، د. أحمد عبد العزيز العويس و آخرون 1415 هـ (Arabic Copy)
<b>Other Learning Materials</b>	Any website related to the subject listed in the experiments

## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	LAB
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	COMPUTER ROOM (LAB) IN THE COLLEGE
<b>Other Resources</b> (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)	Student	Questionnaire
	Departmental Plan and curriculum committee; external reviewers	Reports and workshops
	Program Leader	Meeting
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

<b>Council / Committee</b>	Department counsel
<b>Reference No.</b>	1/22/142
<b>Date</b>	15-9-1442