



Course Specifications

Course Title:	Instrumental analysis-2
Course Code:	465CHEM-2
Program:	Bachelor of Science in Chemistry
Department:	Chemistry
College:	Science
Institution:	King Khalid University

Table of Contents

A. Course Identification	3
6. Mode of Instruction (mark all that apply)	3
B. Course Objectives and Learning Outcomes	3
1. Course Description	3
2. Course Main Objective.....	4
3. Course Learning Outcomes	4
C. Course Content	4
D. Teaching and Assessment	5
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods	5
2. Assessment Tasks for Students	5
E. Student Academic Counseling and Support	5
F. Learning Resources and Facilities	6
1. Learning Resources	6
2. Facilities Required.....	6
G. Course Quality Evaluation	6
H. Specification Approval Data	6

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 7 / Year 4
4. Pre-requisites for this course (if any):	342CHEM-2
5. Co-requisites for this course (if any):	none

6. Mode of Instruction (mark all that apply)

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

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	-
2	Laboratory/Studio	52
3	Tutorial	8
4	Others (specify)	-
	Total	60
Other Learning Hours*		
1	Study	15
2	Assignments	10
3	Library	-
4	Projects/Research Essays/Theses	-
5	Others (specify)	Reports (5)
	Total	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

This course applies different types of instrumental analysis including molecular spectroscopy, electrolysis, conductometric titrations, potentiometric titrations, thin Layer Chromatography (TLC), Gas Chromatography (GC), High Performance Liquid Chromatography (HPLC), Atomic Absorption Spectroscopy (AAS) and Atomic Emission Spectroscopy (AES).

2. Course Main Objective

- To familiarize student with the basic of instrumental methods of analysis
- Giving the student the skills of the preparation of minute concentrations of solutions
- Training the student to the use of the different spectral methods of analysis for chemical analysis
- Training the student to the use of electric methods for chemical analysis
- To familiarize student with the modern instruments of chromatography and giving the student the skills to analysis the results

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	To demonstrate knowledge of the fundamental concepts and principles of analytical chemistry.	K1
1.2	To outline the experimental findings and applications of analytical chemistry in life.	K3
2	Skills :	
2.1	To analyze, interpret and explain the chemical analysis	S1
2.2	To manipulate chemicals following safety procedures.	S2
2.3	To perform chemical analysis experiments and data interpretation.	S3
2...	To use basic glassware, equipment, and instrumentation for chemical analysis.	S4
3	Competence:	
3.1	To show independency in solving simple problems, conducting analytical chemical experiments in line with safety practices.	C2
3.2	To acquire self-confidence to enter job market or integrate graduate programs.	C3
3.3	To show effective oral and written communicate.	C4
3.4	To show working effectively in diverse teams in both classroom and laboratory.	C5

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to the methods of instrumental analysis and preparation the solutions	8
2	spectrophotometric methods of analysis	8
3	Potentiometric method of analysis	8
4	Conductimeric methods	4
5	Chromatographic methods of analysis	12
6	Atomic Absorption Spectrophotometry	4
7	Atomic Emission Spectrophotometry	4
8	Final Exam	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 demonstrate knowledge of the fundamental concepts and principles of analytical chemistry.	Lectures, Interactive teaching sessions	Written exams, electronic quizzes
1.2	To outline the experimental findings and applications of analytical chemistry in life.	Lectures, Interactive teaching sessions	Written exams, electronic quizzes
...			
2.0	Skills		
2.1	To analyze, interpret and explain the chemical analysis	Lectures, problem solving sessions	Written exams
2.2	To manipulate chemicals following safety procedures.	Tutorials, problem solving sessions	written exams
2.3	To perform chemical analysis experiments and data interpretation.	opened essays on selected topics	Class activities
2.4	To use basic glassware, equipment, and instrumentation for chemical analysis.	Interactive teaching sessions	Class activities
3.0	Competence		
3.1	To show independency in solving simple problems, conducting analytical chemical experiments in line with safety practices.	Interactive teaching sessions	Discussion within a group
3.2	To acquire self-confidence to enter job market or integrate graduate programs.	Interactive teaching sessions	Written Reports and summaries
3.3	To show effective oral and written communicate.	Interactive teaching sessions	Written Reports and summaries
3.4	To show working effectively in diverse teams in both classroom and laboratory.	Interactive teaching sessions	Written Reports and summaries

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Every week	10 %
2	Reports	Every week	10 %
3	Major exams	7	20 %
4	Oral test	-	10 %
5	Final exam	-	50 %
	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	Daniel C. Harris, Quantitative Chemical Analysis, W. H Freeman and company, 2007, Eighth Edition.
Essential References Materials	None
Electronic Materials	None
Other Learning Materials	Multimedia associated with the textbook and the relevant websites

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Chemical laboratory with not more than 20 places
Technology Resources (AV, data show, Smart Board, software, etc.)	Computers related to the instruments of analysis
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	- Availability of electronic balances, Micropipette, chemicals, glassware and equipment relevant to the course material - Safety facilities

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 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	Department counsel
Reference No.	1/22/142
Date	15-9-1442