Course Specifications

Course Title:	Research Project
Course Code:	470CHEM-3
Program:	Bachelor of Science in Chemistry
Department:	Chemistry
College:	Science
Institution:	King Khalid University

Table of Contents

A. Course Identification

1. Credit hours: 3	
2. Course type	
a. University [ ]	College [ ] Department [√] Others [ ]
b. Required [√]	Elective [ ]
3. Level/year at which this course is offered: Level 7/ Year 4	
4. Pre-requisites for this course (if any)**:** 323Chem, 314Chem 314, 342Chem, 336Chem	
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	1	33%
2	**Blended**	0	0%
3	**E-learning**	0	0%
4	**Correspondence**	0	0%
5	**Other**	2 Practical	66%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	10
2	**Laboratory/Studio**	15
3	**Tutorial**	0
4	**Others** (specify) (Literature search)	20
	Total	45
Other Learning Hours*		
1	**Study**	
2	**Assignments**	0
3	**Library**	15
4	**Projects/Research Essays/Theses**	15
5	**Others** (specify)	15
	Total	45

***** 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

Introducing the student with the scientific research approach, and how to perform and write it. Student's knowledge about the library and how to use it to get specific information from periodicals and scientific magazines. Developing the student's special abilities in the scientific research. Help the student to acquire the skills of using the library and dealing with various periodicals and scientific magazines. Developing the student's skills in the scientific and experimental research and training them on operating the instruments, as well as on getting and explaining the results. To help the student to be acquainted with the various scientific experiments that are related to the research and train them on the various laboratory instruments.

2. Course Main Objective

Developing the student's special abilities in the scientific research. Help the student to acquire the skills of using the library and dealing with various periodicals and scientific magazines.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	Teach the student a theoretical knowledge about what is the research, its methods, tools and procedures to collect the needed data from its various resources.	K1, K3
1.2	Training students to make a comprehensive library survey about a specific subject/topic and write it properly and discussing it with them.	K1
1.3	Preparing some of the organic and inorganic compounds, then separating and purifying them in Lab.	K2, K3
1.4	Using all the chemical, physical, analytical and spectroscopic means to support the results of the research.	K3
1.5	Developing the skills of the scientific thinking in the students to help them feel the scientific problems that are related to their precise specialization and solve them.	K1
1.6	Developing the student's skills that are related to using the library and teaching him how to find the information from the various periodicals and scientific magazines.	K1
1.7	Teaching the students, the way to write a research	K1
2	**Skills:**	
2.1	Provide experimental evidence and theoretical interpretations of the properties and characterization of compounds.	S1
2.2	The ability to use the library for research purposes.	S1
2.3	Self-reliance in the testing results and conclusion	S3
2.4	The ability to work with the others in the Lab.	S1
2.5	The ability to work with the computers and by using the Internet.	S4
3	**Competence:**	
3.1	To written efficient a research proposal.	C4
3.2	To discuss the research proposal	C5
3.3	To complete the all research parts	C1, C5
3.4	Discuss the research results and recommendation	C5

C. Course Content

No	List of Topics	Contact Hours
1	• Teach the student a theoretical knowledge about what is the research, its methods, tools and procedures to collect the needed data from its various resources.	1
2	• Developing the skills of the scientific thinking in the students to help them feel the scientific problems that are related to their precise specialization and solve them.	1
3	• Developing the student's skills that are related to using the library	1

	and teaching him how to find the information from the various periodicals and scientific magazines.	
4	• Training students to make a comprehensive library survey about a specific subject/topic and write it properly and discussing it with them.	3
5	• Teaching the students, the way to write a research including: - The Title: brief and representing the research topic. - The Introduction: serves the research topic. - The Scientific Experiment: should be written in an easy and clear way. - The Results: should be organized, categorized, divided, scheduled and presented by charts if necessary. - The Discussion: all the chemical, physical, and spectroscopic aids should be used to certify the results. - The Conclusion: to clarify the most important findings of the research. - The References: should be written in a scientific way. - The Summary: should be written in Arabic and English.	8
6	• Complete the practical parts for the research proposal: ▪ Performing advanced experiments that are related to these compounds, ▪ Training the students on using the advanced scientific instruments and on the ways to prepare and analyze the samples, and how to explain the obtained results, ▪ Making physical measurements for some prepared materials such as thermal analysis, corrosion and adsorption, ▪ Studying the kinetics of some organic and inorganic reaction to assign the mechanisms of these reactions. ▪ Using the available laboratory instruments to define and determine the concentration of some environmental pollutants. ▪ Using all the chemical, physical, analytical and spectroscopic means to support the results of the research. ▪ Or an applied subject, collecting samples, treatments, analyses, discussing of the data.	31
Total		45

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	Theoretical Lectures, tutorial, Literature survey on the internet and Library and Practical evidence	Theoretical Lectures, tutorial, Literature survey on the internet and Library and Practical evidence	Theoretical exam, Practical evaluation and thesis discussion
1.2	Theoretical Lectures, tutorial, Literature survey on the internet and Library and Practical evidence		
1.3	Theoretical Lectures, tutorial,		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	Literature survey on the internet and Library and Practical evidence		
1.4	Theoretical Lectures, tutorial, Literature survey on the internet and Library and Practical evidence		
1.5	Theoretical Lectures, tutorial, Literature survey on the internet and Library and Practical evidence		
1.6	Theoretical Lectures, tutorial, Literature survey on the internet and Library and Practical evidence		
1.7	Theoretical Lectures, tutorial, Literature survey on the internet and Library and Practical evidence		
2.0	**Skills**		
2.1	Provide experimental evidence and theoretical interpretations of the properties and characterization of compounds.	Tutorial, Literature survey on the internet and Library and Practical evidence	Practical evaluation and thesis discussion
2.2	The ability to use the library for research purposes.		
2.3	Self-reliance in the testing results and conclusion		
2.4	The ability to work with the others in the Lab.		
2.5	The ability to work with the others in the Lab.		
3.0	**Competence**		
3.1	To written efficient a research proposal.	Theoretical Lectures, tutorial, Literature survey on the internet and Library and Practical evidence	Theoretical exam, Practical evaluation and thesis discussion
3.2	To discuss the research proposal		
3.3	To complete the all research parts		
3.4	Discuss the research results and recommendation		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Theoretical exam.	13	7%
2	Research proposal presentation	1	3%
3	Supervisor practical evaluation	13	40%
4	Research discussion 1	14	25%
5	Research discussion 2	14	25%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)
[&]*separated from theory lecture with independent lecturer*

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice : Appointing a faculty member as a coordinator for the course work.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Depend on the research topic
Essential References Materials	Depend on the research topic
Electronic Materials	Depend on the research topic
Other Learning Materials	Saudi digital library, KKU

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom, Laboratories
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, smart Board & Internet network
Other Resources (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
Course contents (update)	Departmental Plan and curriculum committee; external reviewers	Reports and workshops
Quality of learning resources	Departmental Plan and curriculum committee; 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