



# Course Specifications

<b>Course Title:</b>	<b>Selected topics in inorganic Chemistry</b>
<b>Course Code:</b>	<b>623CHEM-2</b>
<b>Program:</b>	<b>Master of Science in Chemistry</b>
<b>Department:</b>	<b>Chemistry</b>
<b>College:</b>	<b>Science</b>
<b>Institution:</b>	<b>King Khalid University</b>

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## A. Course Identification

<b>1. Credit hours: (Theoretical) : 2</b>
<b>2. Course type</b> 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"/>
<b>3. Level/year at which this course is offered: Level 3 / Year 2</b>
<b>4. Pre-requisites for this course (if any): NO- Pre-requisites</b>
<b>5. Co-requisites for this course (if any): NO- Co-requisites</b>

## 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
<b>Contact Hours</b>		
1	Lecture	30
2	Laboratory/Studio	0
3	Tutorial	0
4	Others (specify)	0
	<b>Total</b>	<b>30</b>
<b>Other Learning Hours*</b>		
1	Study	45
2	Assignments	10
3	Library	5
4	Projects/Research Essays/Theses	---
5	Others (specify)	---
	<b>Total</b>	<b>60</b>

\* 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

It is up to the staff member to select the subjects, textbooks and references related to this course. This course focuses on Applied Chemistry ( Chemistry and Crime – Chemistry and



Energy Production – Hazardous Waste and waste disposal water treatments ( drinking , domestic and industrial waters).

## 2. Course Main Objective

This is the last course of the freshman chemistry sequence. The course establishes the foundation of almost all subsequent courses related to applied chemistry. The students are expected to recognize all topics related to chemistry and crime and related topics such as Finger printing , Chemical test , Powder test , Toxicology and Drug testing , Testing for drugs , testing for Poisons, Arson and Explosives Investigations DNA Fingerprinting , Application of DNA. Chemistry and Energy Production and Nature of Energy , Forms of Energy , Law conservation of Energy. In addition , will covers the hazardous waste and waste disposal water treatments ( drinking , domestic and industrial waters

## 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge:</b>	
1.1	To recognize the application of the theories and principles of chemistry to practical	K1-K3
1.2	To understand the principles of Chemistry and Crime (Forensic Chemistry)	K1-K3
1.3	To outline the Hazardous waste and waste disposal treatments	K1
<b>2</b>	<b>Skills :</b>	
2.1	To deduce treatment ( Pre-treatment , primary treatment , secondary treatment , parameters of solution tested , instruments used for monitoring the metals and organic compounds	S2
2.2	To apply the Radioactive waste treatment ( problem , origin of waste , Types of waste , levels of waste , path ways of waste , Characterization of waste , methods of treatment for liquid , soil , instruments in oil and ( gas production in petroleum industry as example	S3
<b>3</b>	<b>Competence:</b>	
3.1	To present an oral explanation for a subject in the area based on developing critical skills, observation, and feedback.	C3
3.2	To interact positively with colleagues in a group work and to use online resources.	C4
3.3	To contribute with colleagues to prepare and deliver a presentation and report of group work	C1-C2
3.4	To summarize the literature and sources for an area in the course.	C2

## C. Course Content

No	List of Topics	Contact Hours
1	Chemistry and Crime (Forensic Chemistry ) include the following : Finger printing Chemical test , Powder test	6



	Toxicology and Drug testing Testing for drugs , testing for Poisons Arson and Explosives Investigations DNA Fingerprinting Application of DNA	
2	Chemistry and Energy Production include the following : Nature of Energy Forms of Energy Law conservation of Energy Nuclear energy and their application in production of electricity	6
3	Hazardous waste and waste disposal treatments :  Sewage treatment ( Pre-treatment , primary treatment , secondary treatment , parameters of solution tested , instruments used for monitoring the metals and organic compounds )  Radioactive waste treatment ( problem , origin of waste , Types of waste , levels of waste , path ways of waste , Characterization of waste , methods of treatment for liquid , soil , instruments in oil and gas production in petroleum industry as example )  Midterm Exam 1	4
4	Nano carbon : Different forms of nano carbon , properties and applications	4
5	Nano materials :  Nano scale Materials  Synthesis methods of Nanomaterial  Applications	6
6	Catalysis : Types of catalysis ( homo , hetero , auto ) Components of different types of catalysis Advantages and disadvantages of different types of catalysis Application in industry	4
	<b>TOTAL</b>	<b>30</b>

## 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 Provide the application of the theories and principles of chemistry to practical	Lectures , Interactive teaching sessions	Written exams, oral discussion, electronic quizzes
1.2	To understand the principles of Chemistry and Crime (Forensic Chemistry)	Lectures , Problem solving sessions	Written exams, electronic assignments
1.3	To outline the Hazardous waste and waste disposal treatments	Lectures, Interactive teaching sessions	Written exams and electronic quizzes
<b>2.0</b>	<b>Skills</b>		
2.1	To deduce treatment ( Pre-treatment , primary treatment , secondary treatment , parameters of solution tested , instruments used for monitoring the metals and organic compounds	- Lectures, problem solving sessions - Laboratory demonstration and group work weekly.	Written exams, oral exams
2.2	To apply the Radioactive waste treatment ( problem , origin of waste , Types of waste , levels of waste , path ways of waste , Characterization of waste , methods of treatment for liquid , soil , instruments in oil and gas production in petroleum industry as example )	Laboratory experiments weekly	Oral discussion, written examinations
<b>3.0</b>	<b>Competence</b>		
3.1	To present an oral explanation for a subject in the area based on developing critical skills, observation, and feedback.	To present an oral explanation for a subject in the area based on developing critical skills, observation, and feedback.	opened essays on selected topics
3.2	To interact positively with colleagues in a group work and to use online resources.	Interactive teaching sessions	Oral presentation, report
3.3	To contribute with colleagues to prepare and deliver a presentation and report of group work	Interactive teaching sessions	Discussion within a group
3.4	To summarize the literature and sources for an area in the course.	Guided reading of books and articles	Written Reports and seminars

## 2. Assessment Tasks for Students

#	*Assessment task	Week Due	Percentage of Total Assessment Score
1	Oral presentation, report, seminar, oral discussion	3rd, 5th, 8th, 11th	10
2	Midterm exam-1	7th	20
3	Midterm exam-2	13th	20
4	Final Written Exam	16th	50%



\*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 :

Office hours give students the opportunity to ask in-depth questions and to explore points of confusion or interest that cannot be fully addressed in the Lab: For this reason, instructor provides at least 10 office hours per week. My e-mail address is also used for any consultations during the vacations.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	G. L. Fischer, P. J., Tarr, A. Donald, G. L. Missler, Inorganic Chemistry, Pearson Prentice Hall, 3rd ed., 2013.
<b>Essential References Materials</b>	N. T. Lappas, Forensic Toxicology: Principles and Concepts, 1st ed., Elsevier 2016
<b>Electronic Materials</b>	Saudi Digital Library
<b>Other Learning Materials</b>	Handouts will be distributed to the students

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> Classrooms, laboratories, demonstration) (.rooms/labs, etc	Air-conditioned rooms (45 seats) Laboratory Rooms (16 person per lab)
<b>Technology Resources</b> AV, data show, Smart Board, software,.) (.etc	MS-Office Software and Internet connection
<b>Other Resources</b> Specify, e.g. if specific laboratory) equipment is required, list requirements or (attach a list	Overhead projector Computer for individual students  Internet access

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
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Strategies for Obtaining Student Feedback on Effectiveness of Teaching	Program leaders	Confidential completion of standard course evaluation questionnaire. Focus group discussion with small groups of students.
Other Strategies for Evaluation of Teaching by the Instructor or by the Department	Faculty, Peer reviewer	Observations and assistance from colleagues, independent assessment of standards achieved by students. Independent advice on assignment tasks, etc.
Processes for Improvement of Teaching	Faculty	Developing the lectures periodically
Processes for Verifying Standards of Student Achievement (eg. 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)	Faculty	Meetings are conducting with teachers for checking the grading of the exams.
Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.	Faculty Students	Teachers' survey Students' survey

**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>	<u><a href="#">Chemistry Department Council</a></u>
<b>Reference No.</b>	Session number 22
<b>Date</b>	27/04/2021M / 15/09/1442H

