



Course Specifications

Course Title:	Inorganic Chemistry
Course Code:	466CHEM-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
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered:	Level 8 / Year 4
4. Pre-requisites for this course (if any):	323CHEM
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	0	0
2	Blended	0	0%
3	E-learning	0	0%
4	Correspondence	0	0%
5	Other (Laboratory)	2	100%

7. Actual Learning Hours (based on academic semester)

* 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

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	15
2	Assignments	15
3	Library	0
4	Projects/Research Essays/Theses	0
5	Others (specify) Present a communication and poster	0
	Total	30

B. Course Objectives and Learning Outcomes

1. Course Description

- Preparation of some inorganic compounds.
- Study the physical and chemical properties of the prepared compounds
- Writing a scientific report summarizing the results obtained during the experiment.
- Trying to explain these results and compare the practical results with theoretical. This report is introduced within a week of the experiment.
- Application of the principle of cooperative learning.
- Work effectively both in a team, and independently on solving problems.
- Communicate effectively with his lecturer and colleagues.
- Add scores for students who interact with the Instructor during the lab.

2. Course Main Objective

The main purpose of this course is to demonstrate to students the synthesis methods of inorganic materials, characterization techniques; and learn a skill to identify the materials compositions, degree of purity and melting point of some pure materials, etc.

The course also aims at training students to purify solid inorganic compounds and identify it by titration, Infrared spectroscopy and X-ray diffraction techniques.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Recognize the ways to prepare some inorganic compounds and some complexes and understanding its reactions and their molecular structure	K2
1.2	Acquire the correct way of thinking to prepare and analyze inorganic compounds and complexes.	K2 and K3
1.3	Attempt to find solutions to some problems during doing the experiments.	K3
1.4	Recognize elements oxidation states and their stability in the solution.	
2	Skills :	
2.1	The ability to use inorganic preparations techniques. Predict some properties of complexes through examination	S1
2.2	Ability to Explanation the results obtained in the preparation and analysis of inorganic compounds.	S4
2.3	The ability to calculate the efficiency of the experiment, and determination of components percentages of inorganic compounds.	S3
3	Competence:	
3.1	Working in groups as a team.	C3 and C4
3.2	Assume responsibility.	C3 and C4
3.3	Teach students the ethics of dealing with his colleagues and lab lecturer.	C1
3.4	Instill self-learning character in student.	C4
3.5	Communicating with the other.	C2
3.6	Use the library and Internet.	C3

C. Course Content

List of Topics	Contact Hours
<ul style="list-style-type: none"> Clarification Course Syllabus, objectives and the study plan during the semester. Explain and clarify how students can write a scientific report, contains all the obtained results. laboratory safety rules 	4
<ul style="list-style-type: none"> Synthesis of Carbonato Tetramine Cobalt(III) Nitrate $[\text{Co}(\text{NH}_3)_4\text{CO}_3]\text{NO}_3$, then determination of Cobalt(III) in complex. 	4
<ul style="list-style-type: none"> Synthesis of ChloroPentaamine Cobalt(III) Chloride $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$, then determination of Cobalt(III) and chloride in complex. 	4
<ul style="list-style-type: none"> Purification of Potassium Iodate by recrystallization, then determination the purity of Potassium Iodate before and after recrystallization. 	4

4	• Determination of Bond Order, Oxidation Number and Oxidation State of Cyanide Compounds by Infrared Spectroscopy.	4
5	• Synthesis and Investigation of Potassium Alum	4
6	• Practical, Midterm Exam. Theoretical, Midterm Exam.	4
7	• Geometrical Isomerisms, preparation of trans-Dichlorobis(ethylenediamine) Cobalt(III) Chloride, and cis-Dichlorobis(ethylenediamine) Cobalt(III) Chloride	8
8	• Synthesis Of Copper(I) Halides and Some of its Complexes.	4
9	• Tetra-ammine Copper(II) Sulphate Hydrate [Cu(NH ₃) ₄]SO ₄ H ₂ O, Analysis of sulphate, copper, and ammonia in complex.	8
10	• Synthesis of Tris(AcetylAcetonato) Chromium (III) [Cr(acac) ₃], then determination of Chrome (III) in complex.	4
11	• Determination of 10dq (Δ_o) in Some Cr(III) Complexes.	4
	• 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 be more familiar with new skills and experiments in physical chemistry	- Lectures , Interactive - teaching sessions	- for each experiment. - - - Oral and written exams during the term.
1.2	Acquire the correct way of thinking to prepare and analyze inorganic compounds and complexes.	- Interactive teaching	
1.3	Attempt to find solutions to some problems during doing the experiments.	- sessions	- Oral and written exams during the term.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.4	Recognize elements oxidation states and their stability in the solution.	Lectures , Interactive teaching sessions	- Written Report for each experiment.
2.0	Skills		
2.1	Scientific and practical skills to use the most recent instruments	Lectures, problem solving sessions	Oral questions during doing experiment. - Quizzes
2.2	To obtain research ability and mathematical skills. The ability to calculate the efficiency of the experiment, and determination of components percentages of inorganic compounds.	Lectures, problem solving sessions Lectures, problem solving sessions	Oral questions during doing experiment. - Quizzes
2.3			
3.0	Competence		
3.1	Learning how to cooperate with his colleagues in the laboratory.	Discussion and dialogue	-Oral questions during doing experiment in the lab.
3.2	To use an internet technology and library to find out the suitable information to perform their theoretical parts of their reports	opened essays on selected topics	- Mandated the student to make reports by using the search in the library and the Internet
3.3	Teach students the ethics of dealing with his colleagues and lab lecturer. Instill self-learning character in student.	Clarification the seriousness of some experiments on the student himself to learn	
3.4			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical, Midterm Exam	7	10%
2	Theoretical, Midterm Exam	7	10%
3	Lab. Evaluations	weekly	10%
4	Reports	weekly	20%
5	Practical, Final Exam	16	30%
6	Theoretical, Final Exam	16	20%

*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 10 hr/ week

To interact and communicate with students to provide academic advice and guidance

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	“Inorganic Chemistry: Principles of Structure and Reactivity“, James E. Huheey and coll, 4th Ed, ISBN 9780060429959, H J I 546, N°6248 (2013). Chemistry of transition elements "Dr. Ayed Alshihry and others 2005
Essential References Materials	“Inorganic Chemistry “Catherine E. Housecroft and coll, 4th Ed, ISBN 978-0-273-74275-3, H C I 54 (2013).
Electronic Materials	http://www.nature.com/nature/journal/v382/n6589/abs/382313a0.html https://books.google.com.sa/books?id=mJBW5pLF5R8C&pg=PA205&lpg=PA205&dq=Inorganic+chemistry+synthesis+books+american&source=bl&ots=RvTbnpW4t8&sig=kBTQ05hzASa7p-y1bUNelHAFyDY&hl=fr&sa=X&ved=0ahUKEwir-qmuqcLSAhXG1hQKHdYUBO8Q6AEIVTAI#v=onepage&q=Inorganic%20chemistry%20synthesis%20books%20american&f=false
Other Learning Materials	-White boards. - Colored pens writing.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	- Laboratory equipped with an appropriate number of seats (12-15), distributed in the form which allows the teacher and students to move easily. - Provide the laboratory with appropriate number of suction fans distributed appropriately to suction gases. - Preparation room.

Item	Resources
<p>Technology Resources (AV, data show, Smart Board, software, etc.)</p> <p>Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)</p>	<p>Providing a computer Provide internet line</p> <ul style="list-style-type: none"> - Provide the laboratory with hood for dangerous reactions. - Provide the laboratory with the tools of civil defense of the gas leak detector and fire extinguishers and first aid kit. - especially bench resistance to chemicals, and a sufficient number of drainage ponds resistance to chemicals - Availability of 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	Meeting
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