

National Commission for Academic Accreditation & Assessment

Course Specification

Institution	King Khaled University
College/Department	Science / chemistry

A Course Identification and General Information

1. Course title and code: Practical inorganic chemistry chem. 466
2. Credit hours: 2 hr
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Chemistry Bachelor
4. Name of faculty member responsible for the course Husam Al Janaydeh
5. Level/year at which this course is offered Level 8 / fourth year
6. Pre-requisites for this course (if any) No
7. Co-requisites for this course (if any) No
8. Location if not on main campus main campus / inorganic Chemistry Laboratory

B Objectives

1. Summary of the main learning outcomes for students enrolled in the course.
 1. **Expanding perception and practical knowledge for students to familiarize them with the importance of the principles of inorganic chemistry.**
 2. **Recognize the types of isomers for some complexes, and distinguish between these isomers.**
 3. **Recognize a group of techniques which can be used to prepare and characterize inorganic compounds, and get an experience in preparing and analyzing the different categories of inorganic compounds.**
 4. **Understand the different oxidation states for some transition elements, their chemical activity and their magnetic properties.**
 5. **Understanding the impact of complexity (complex formation) on the stability of oxidation state for some transition elements ions.**
 6. **Recognize the chemical spectrum chain and its ability to split (d) orbital levels, and whether the practical results of some studied ligands identical with this chain theoretically by calculating the value of (Δ_o).**
 7. **Prediction bond order, oxidation number and coordination number by studying the infrared spectrum for some complexes.**
 8. **The ability to write complete scientific reports which summarize the theoretical material related with the experiment, statements and results that were obtained and discuss these results.**
 9. **Determination the percentage for the components of complexes and inorganic compounds, then comparing theoretical percentage with practical one.**
 10. **Determination of percentage yield (the efficiency of experiment).**
2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field)
 - **Writing a scientific report summarizing the results obtained during the experiment. And 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.**

C.Course Description(Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
List of Topics	No of Weeks	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 	1	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. 	1	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. 	1	4
<ul style="list-style-type: none"> • Purification of Potassium Iodate by Crystallization, then determination the purity of Potassium Iodate before and after Crystallization. 	1	4
<ul style="list-style-type: none"> • Determination of Bond Order, Oxidation Number and Oxidation State of Cyanide Compounds by Infrared Spectroscopy. 	1	4
<ul style="list-style-type: none"> • Synthesis and Investigation of Potassium Alum 	1	4
<ul style="list-style-type: none"> • Practical, Midterm Exam. • Theoretical, Midterm Exam. 	1	4
<ul style="list-style-type: none"> • Geometrical Isomerisms, preparation of trans-Dichlorobis(ethylenediamine) Cobalt(III) Chloride, and cis-Dichlorobis(ethylenediamine) Cobalt(III) Chloride 	1	4
<ul style="list-style-type: none"> • Synthesis Of Copper(I) Halides and Some of its Complexes. 	1	4
<ul style="list-style-type: none"> • Tetra-ammine Copper(II) Sulphate Hydrate $[\text{Cu}(\text{NH}_3)_4]\text{SO}_4\cdot\text{H}_2\text{O}$, Analysis of sulphate, copper, and ammonia in complex. 	1	4
<ul style="list-style-type: none"> • Synthesis of Tris(AcetylAcetonato) Chromium (III) $[\text{Cr}(\text{acac})_3]$ 	1	4
<ul style="list-style-type: none"> • Determination of $10dq (\Delta_0)$ in Some Cr(III) Complexes. 	1	4
<ul style="list-style-type: none"> • Practical, Final Exam. • Theoretical, Final Exam. 	1	4

2 Course components (total contact hours per semester):				
Lecture:	Tutorial:	Laboratory: 60	Practical/Field work/Internship	Other:

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week)

3 hours of search and writing lab reports.

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

This course is designed to develop thinking and conclusion skills and to expand students perceptions by offering easy methods to find information and search about it in the internet or library and open debates to improve scientific and knowledge levels for the students.

a. Knowledge

(i) Description of the knowledge to be acquired

- **Recognize the ways to prepare some inorganic compounds and some complexes and understanding its reactions and their molecular structure.**
- **Acquire the correct way of thinking to prepare and analyse inorganic compounds and complexes.**
- **Attempt to find solutions to some problems during doing the experiments.**
- **Recognize elements oxidation states and their stability in the solution.**

(ii) Teaching strategies to be used to develop that knowledge

- **Open discussions.**
- **Search in library and internet.**
- **Present individual or collective reports.**

(iii) Methods of assessment of knowledge acquired

- **Discuss all experiment aspects to expand students' perspectives.**
- **Midterm and final Exam.**
- **Trying to find the components for a compound practically by doing two exams after complete seven and fourteen experiments, grades for each one is 10.**
- **Present complete report contains all results, evidences and discussions.**

b. Cognitive Skills

(i) Description of cognitive skills to be developed

- **The ability to use inorganic preparations techniques**
- **Ability to Explanation the results obtained in the preparation and analysis of inorganic compounds.**
- **Predict some properties of complexes through examination**
- **The ability to calculate the efficiency of the experiment, and determination of components percentages of inorganic compounds.**

(ii) Teaching strategies to be used to develop these cognitive skills

- **Discussion collectively and then individually for development thinking skills. and cooperate to analyze and solve problems.**
- **Training to solve chemical questions.**
- **Explanation illustrative examples.**

(iii) Methods of assessment of students cognitive skills

- **Discuss the experiment and preparation procedure.**
- **Monitor the performance of students while working; this method represents 10% of total evaluation.**
- **Terminal and final exams which include calculations as an application for basics and concluding questions like: explain, and what's happened if..., these questions represent 30% of total evaluation.**

c. Interpersonal Skills and Responsibility	
(i) Description of the interpersonal skills and capacity to carry responsibility to be developed	<ul style="list-style-type: none"> - Working in groups as a team. - Assume responsibility. - Teach students the ethics of dealing with his colleagues and lab lecturer. - Instil self-learning character in student.
(ii) Teaching strategies to be used to develop these skills and abilities	<ul style="list-style-type: none"> - Distribution of students into different groups to acquire the skills of deal with everyone. - Assigning students to search about a specific topic in each experiment to learn them the skill of self-learning. - Clarification the seriousness of some experiments on the student himself to learn him responsibility toward himself and toward his colleagues.
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility	<ul style="list-style-type: none"> - Direct observation of the students. - Evaluate the performance of students while exercising of collective work. - Raising hypothetical issues and note the way the students deal with it.
d. Communication, Information Technology and Numerical Skills	
(i) Description of the skills to be developed in this domain.	<ul style="list-style-type: none"> - Communicating with the other. - Use the library and Internet.
(ii) Teaching strategies to be used to develop these skills	<ul style="list-style-type: none"> - Discussion and dialogue. - The practical training. -

(iii) Methods of assessment of students numerical and communication skills <ul style="list-style-type: none"> - The written tests. - Mandated the student to make reports by using the search in the library and the Internet.
e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required <ul style="list-style-type: none"> - The use of devices and laboratory instruments in a scientific, practical and correct way. - Use the tools and chemicals needed for the experiment in safe and correct way.
(ii) Teaching strategies to be used to develop these skills Training strategy
(iii) Methods of assessment of students psychomotor skills Assessment students' performance

5. Schedule of Assessment Tasks for Students During the Semester			
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Practical, Midterm Exam	7	10%
2	Practical, Final Exam	14	10%
3	Theoretical, Midterm Exam	7	10%
4	Theoretical, Final Exam	14	10%
5	Lab. Evaluations	weekly	20%
6	Reports	weekly	40%

D. Student Support

1. Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **Office hours 10 hr/ week**

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

E Learning Resources

1. Required Text(s) “Practical Inorganic Chemistry “ Mohammad B. hassan and others, 1nd Ed. (1996).
2. Essential References “Synthesis and Technique in Inorganic Chemistry “ R.J. Angelici, 2nd Ed. (1987).
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List) Chemistry of transition elements "Dr. Ayed Alshihry and others 2003
4-.Electronic Materials, Web Sites etc Websites on the internet that are relevant to the topics of the course
5- Other learning material such as computer-based programs/CD, professional standards/regulations - White boards. - Colored pens writing.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.)

<ul style="list-style-type: none"> - 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.
<p>2. Computing resources</p> <ul style="list-style-type: none"> - Providing a computer - Provide internet line
<p>3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)</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 Evaluation and Improvement Processes

<p>1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching</p> <ul style="list-style-type: none"> 1 - Design questionnaire supported from Department to be distributed between the students to evaluate the effectiveness of teaching. 2 - Organize meetings between the department and students for dialogue and discussion. 3 - Make meetings Individual or collective with the students to listen to their feedback.
<p>2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department</p> <ul style="list-style-type: none"> - Department discussion of reports received from members of the Department to develop performance.

<p>3 Processes for Improvement of Teaching</p> <p>Participate with technical institutions to provide training and practice for students.</p>
<p>4. 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)</p> <p>- The exchange of samples of student work between the faculty members for evaluation.</p>
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <p>- Access to reports and recommendations received from the Commission for Academic Accreditation.</p> <p>- Compared Course Description with similar courses descriptions in the local and international universities</p>