Forman Christian College (A Chartered University)

Department of Chemistry

Course Information

Course Title	Advanced Inorganic Chemistry
Course Code	CHEM 450
Course Instructor	Dr. Mariya al-Rashida; Room No. S103
Semester	Spring 2023
Credit	3 + 1
Notes & Handouts and latest researches according to the topic will be provided to the students	

COURSE REQUIREMENTS

Students are expected to attend every class and to arrive on time. Attendance less than 80% may lead to negative effect on grade. Students can consult the instructor during office hours for any difficulty related to the course.

There is no making up for quizzes, while make up for mid term exam is possible for only under extreme cases. Along with theory, practical classes are mandatory, a student will not be allowed to take practical exam if he/she was absent during practicals/lab. Some of the course topics may be covered during practical classes.

LEARNING GOALS

The student learning goals for this course have been designed and divided into 3 difficulty levels, details of each is given below:

Difficulty Level 1: Retrieval/Recall

Students are expected to recall basic definitions, the "what" type questions.

Difficulty Level 2: Comprehension

Students are expected to explain their "understanding of basic principles" learned in

this course.

Difficulty Level 3: Analysis

Students are expected to be able to solve higher level problems similar to what they have already learned in this course

At the end of this course students should be able to:

1. Understand the basic concepts/theories of inorganic chemistry and especially chemical bonding.
2. Apply the concepts to solve problems related to the subject.
3. Contribute towards knowledge practically using rational and logical thinking objectives.
4. Correlate the subject knowledge to other disciplines of chemistry.

Category	**Representative Skill**	**Student Learning Objective (SLO)**
Knowledge (Memorization)	Recall, remember or recognize information	**Student must be able to** remember and recall the trends in physical and chemical properties of lanthanides and actinides.
Comprehension (Understanding)	Relate discrete facts, summarize or rephrase ideas and concepts	**Student must be able to** compare and contrast chemistry of f-block elements to other metals of the periodic table, in particular the d-block elements. Be able to understand how bonding of pi-acceptor ligands is different from typical ligand bonding.
Application	Apply rules, laws, theories and learned concepts to solving problems	**Student must be able to** predict reactions of lanthanides and actinides. Be able to predict geometries of

		different metal carbonyls and nitrosyls.

COURSE OUTLINE & LECTURE PLAN

Week	Topics
1-2nd week	Introduction to f-block elements, 4f and 5f series, their occurrence, mining, extraction and other physical properties
3-4th week	lanthanide contraction, electronic configuration, general properties, oxidation states
5th week	Hydroxides, oxides, hydrides, halides, carbides etc. Coordination and optical properties, Applications
	Mid Term
6th -7th week	Introduction to 5f series (actinides), electronic configuration, general properties, oxidation states
7-8th week	Hydroxides, oxides, hydrides, halides, carbides etc. Coordination and optical properties, Applications
9th-10th week	Metal Carbonyls, bonding situation, properties, synthesis
11th week	Chemical reactions and applications
12th week	Metal nitrosyls, bonding situation
13-14th week	Synthesis, properties and applications
	Final Exams

COURSE EVALUATION

Quizzes : 10%

Assignments : 5%

Mid Term : 20%

Final Term : 35%

Practical Exam : 25%

Class participation : 5%

COURSE REQUIREMENTS AND WHAT IS EXPECTED OF STUDENTS!

Use of Cell/mobile Phone in Class (including lab work)

1. You are not allowed to use cell phones or mobile phones during your classes, EVEN AS A CALCULATOR! Before you enter your class, either switch off your phone or put it on silent mode.
2. Use of Cell/mobile Phone in Quiz and Exams (Including Lab exam)
3. Is STRICTLY prohibited, if a student is caught with a cell phone during an exam (irrespective of whether he/she was using it or not), the student will be immediately asked to leave the exam and given an F. DON'T BRING YOUR CELL PHONES INSIDE EXAMINATION ROOM/CLASS.

ATTENDANCE

1. Students are expected to attend every class and to arrive on time. Instructor may choose to lower a student's grade on the basis of attendance. Students can consult the instructor during office hours for any difficulty related to the course.

QUIZZEZ

1. There is no making up for quizzes. It is therefore strongly recommended that the student inform the Instructor BEFORE the quiz in written why he/she will be unable to take the quiz.

MID TERM AND FINAL EXAM

Make up for mid term exam is possible for only under extreme cases and the student is to submit a written application for that. If a student is not able to give Mid Term exam on the date specified by the Instructor, it is strongly recommended that he/she informs me well before time in the form of a written Application clearly stating the reasons why he/she will be unable to give Mid Term Exam on time. If a student misses Final Exam without prior notification (written application) to the course Instructor, his/her application will NOT be entertained unless approved from the Head

of Chemistry department.

PRACTICAL/LAB WORK

1. Along with theory, practical classes are a mandatory, a student will not be allowed to take in practical exam if he/she was absent during practicals/lab. Some of the course topics can be covered during practical classes. Students are to maintain a Lab journal (practical copy) in which they write all lab work. This Lab journal/practical copy will be checked every week in Lab. DO BRING A LAB COAT WITH YOU FOR YOUR EVERY LAB!
2. You will be required to appear for your final Lab exam shortly before your final term exam, the exact date will be given to you.

ASSIGNMENT AND PLAGIARISM POLICY!

1. Students will be given two assignments, one individual assignment (before Mid Term Exams) that each student has to complete individually. The second Assignment (after Mid Term Exam) could be a group assignment; efforts of all group members will earn their group a grade, performance of every student in a group reflects on the overall grade of that group.

BOOKS

1. B. Douglas, D McDaniel, J. Alexander, "Cocepts and Models of Inorganic Chemistry" Wiley, 3rd ed, 1993.
2. Chemistry and Chemical reactivity by John C. Kotz and Paul M. Treichel, Jr., 5th Ed., Thomson Books/Cole, USA.
3. Selected topics in inorganic chemistry by Wahdu U. Malik, G.D. Tuli and R.D.Madan, S. Chand and Company Ltd., RamNagar, New Delhi.