

Course Syllabus

A. COURSE INFORMATION AND TEACHING STAFF

1. Course	Name	INORGANIC CHEMISTRY LAB						
	Code	100313251						
	Activity	Lab						
	Credit hours	1						
	Semester	Fall 2023/2024						
	Pre-requisite	100311061 GENERAL CHEMISTRY LAB II, 100313220 INORGANIC CHEMISTRY II						
2. Teaching staff, time and location	Section	Building	Room	Day	Time	Instructor	Office hours	
	1	A&S	236	M	08:30-11:20	Dr.Muayad Masoud Mahmoud Masoud muayad.masoud@aaup.edu	NTh 08:30 - 09:20 T 10:30 - 11:20 W 08:30 - 11:20	

B. COURSE POLICIES

1. Commitment and Attendance	<p>Attendance is required; and university regulations in this regard are strictly applied. It is important to note the following:</p> <ol style="list-style-type: none"> The student is expected to follow all announcements issued by the university, faculty, department as well as the course instructor through the official channels. It is the student's full responsibility to get aware of these announcements and to react accordingly. The student has to communicate electronically with the course instructor, whenever needed, through the official channels exclusively which are limited to the AAUP email and Moodle messages only. The student is expected to attend all classes* and to arrive at classroom on time. If the instructor is late for class, the student must wait for at least 10 minutes before leaving the classroom. Absence by more than 25% of classes leads to an automatic withdrawal from the course (the grade W is assigned).
2. Performance of assessment activities	<p>The student must perform all course assessment activities, i.e. assignments, quizzes, exams etc. It is important to note the following:</p> <ol style="list-style-type: none"> Absence from an exam or a quiz other than the final exam leads to a zero mark in that exam or quiz. An exception allowing a makeup is made for a student submitting a legitimate excuse that is accepted by the instructor in a timely manner. Absence from the final exam leads to an FA grade that eventually turns to an F grade. An exception allowing a makeup exam is made if the student submits an official excuse that is accepted by the Academic Affairs in compliance with the university regulations.

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3. Academic Integrity

The student is expected to be honest during the performance of assessment activities. While not limited to the list below, the following actions are examples of cheating:

1. Copying from other students.
2. Using materials that are not authorized by the proctor during quizzes or exams.
3. Collaborating with other students during quizzes or exams.
4. Stealing or buying the content of exams, quizzes, and assignments.
5. Stealing ideas and work of others and presenting them as that of the student

4. Grading

The university uses the letter grading system. It is important to note the following:

1. The passing grade is D, and the corresponding score (out of 100) is determined at the end of the semester.
2. At the end of the semester, the scale of scores is determined by converting each

5. Learning and teaching methods

Lab. meetings	Sessions involve the presentation of theory, the explanation of experimental procedures and the execution of scientific experiments.
Readings	This must be a key responsibility to each student. Students should read the relevant part of the laboratory manual before the meeting. They should be prepared to raise questions and to get engaged in arguments on related topics in the lab schedule.
Procedure applications	Students are expected to practice the application of the experimental procedures competently, following the instructions in the lab manual and under the supervision of the lab instructor.
Demonstrations	The lab instructor provides demonstrations to help students understand complex concepts and procedures.
Feedback	The lab instructor provides the students with feedbacks on their performance throughout the course, which can help them to realize their weaknesses and work harder to improve their performance.

C. COURSE DETAILS

1. Course description & purpose

Practical Inorganic Chemistry Course: Preparation of typical inorganic complexes of some non-transition and transition elements, studying the characterization of these complexes using the physical techniques as the spectral, electrical and magnetic properties (IR, UV-Vis).

2. Course learning outcomes (CLOs)

	Upon the completion of the course, students will be able to achieve the following learning outcomes:
CLO1	Apply laboratory safety as an important component in the laboratory class.
CLO2	Carry Out experimental work in inorganic chemistry independently and learn basic and advanced laboratory procedures used in inorganic synthesis.
CLO3	Discuss the chemical literature and to read and understand technical literature related to the discipline (coordination complex compounds in aqueous solutions and their equilibria).
CLO4	Practice analytical, physical and spectroscopic characterization techniques to identify and characterize coordination complexes and their different types of isomers.

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2. Course learning outcomes (CLOs)		Upon the completion of the course, students will be able to achieve the following learning outcomes:		
	CLO5	Plan multi-step experiments in coordination chemistry and to contribute to solutions of problems encountered in an experiment.		
	CLO6	Explain some principles of coordination chemistry through the experimental work.		
	CLO7	Communicate the results of scientific experiments in oral reports, technical graphics, and written reports.		
	CLO8	Follow high standards of professional and scientific ethics.		
3. Assessments	Assessment tool	Weight %	CLOs	Due week
	Report	25%	7,8	
	Mid. Term	30%	1,2,3,4,5,6	7
	Activity	5%	1,2,3,4,5,6,8	
	Final Exam	40%	2,3,4,5,6	16
	Total	100%		

null

4. CLOs assessment	Outcomes	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5	CLO 6	CLO 7	CLO 8
	1 - Report							✓	✓
	2 - Mid. Term	✓	✓	✓	✓	✓	✓		
	3 - Activity	✓	✓	✓	✓	✓	✓		✓
	4 - Final Exam		✓	✓	✓	✓	✓		

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5. Course
schedule

Week	Topics	Study material	Assignment	CLOs
1	Outline of the course & Safety in the lab	Handout		1
2	Safety in the Lab. & Check-in	Manual P. 4-7		1
3	Preparation of some Aluminum Complexes	Expt. 1, Manual P. 8		1,2,3,6
4	Preparation of Some Manganese Complexes	Expt. 2, Manual P. 14		1,2,3,4, 5,6,7
5	Geometrical Isomers: Cis & Trans Isomers of Dichlorobis(ethylenediamine)cobalt(III) Chloride	Expt. 3, Manual P. 20		2,3,4,5, 6,7
6	Studying the Spectrochemical Series: Crystal Fields of Cr(III) (preparation of complexes & UV measurement)	Expt. 4, Manual P. 24		2,3,4,5, 6,7
7	Mid. Term			
8	Preparation of $\text{Co}(\text{NH}_3)_3(\text{NO}_2)_3$, $[\text{Co}(\text{NH}_3)_4\text{CO}_3]\text{NO}_3$, $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$, $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$	Expt. 5, Manual P. 28		2,3,5,6, 7
9	Conductivity measurement	Expt. 5, Manual P. 34		4
10	Linkage Isomerism of some Co-complexes	Expt. 6, Manual P. 36		2,3,4,5, 6,7
11	Tetrahedral Nickel Complexes: Preparation of $[\text{Ni}(\text{Et}_4)_2][\text{NiBr}_4]$	Expt. 7, Manual P. 40		2,3,5,6, 7
12	Nickel analysis and Magnetic measurements	Expt. 7, Manual P. 42		4
13	Hard-Soft Acids and Bases: Altering the $\text{Cu}^+/\text{Cu}^{2+}$ Equilibrium with Nitrogen, Oxygen, or Halide Ligands	Expt. 8, Manual P. 53		2,3,5,6, 7

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	Week	Topics	Study material	Assignment	CLOs
5. Course schedule	14	Infrared spectroscopy measurements for some inorganic complexes	Expt. 10, Manual P. 61		4
	15	Revision and check-out			3
	16	Final Exam			

D. COURSE MATERIAL

1. Textbook	Laboratory manual for Inorganic chemistry, prepared by Dr. Muayad Masoud
2. Reference material	<ul style="list-style-type: none"> - Synthesis and Techniques in Inorganic Chemistry, R. J. Angeleci, 2nd Ed. (1977), W.B. Saunders Co. – Philadelphia. - Practical Inorganic Chemistry, G. Pass and H. Sctcliff, 2nd Ed. (1974) Halsted Press – NY - Inorganic Experiments, J. Derek Woollins, 2nd Ed., (2003), Wiley-UK, ISBN: 978-3-527-30510-0 - Inorganic Chemistry, Catherine Housecroft, Alan G. Sharpe, 4th Ed., 2012, Prentice Hall ISBN: 9780273742753 - Inorganic Chemistry, Miessler, Gary L. and Donald A. Tarr, 3rd Ed, (2004) Prentice Hall - Basic Inorganic Chemistry, Cotton, F. Albert, Geoffrey Wilkinson, and Paul L. Gaus, 3rd Ed (1995) John Wiley ISBN: 471505323 - Concepts and Models of Inorganic Chemistry, Douglas, Bodie, Darl McDaniel, and John Alexander, 3rd Ed (1994), John Wiley, ISBN: 471629782 - Inorganic Chemistry: Principles of Structure and Reactivity, Huheey, James E., Ellen A. Keiter, and Richard L. Keiter, 4th Ed, (1993), Benjamin Cummings, ISBN: 006042995X - Introduction to Inorganic Chemistry, Keith F. Purcell, John C. Kotz, (1980) Brooks Cole, ISBN: 0030567688
3. Internet resources	1. Safety: https://www.youtube.com/watch?v=gi3DeFY0cfw https://www.youtube.com/watch?v=8J_3PfGw3Bg 2. Magnetic susceptibility balance: https://www.youtube.com/watch?v=SMcJskQhaW0 3. Infrared spectroscopy: https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/infrared-spectroscopy-theory/v/introduction-to-infrared-spectroscopy + https://www.youtube.com/watch?v=YggYW0H9tDg