Form: Course Syllabus	Form Number	EXC-01-02-02A
	Issue Number and Date	2963/2022/24/3/2 5/12/2022
	Number and Date of Revision or Modification	2/(10/12/2023)
	Deans Council Approval Decision Number	50/2023
	The Date of the Deans Council Approval Decision	26/12/2023
	Number of Pages	06

1.	Course Title	Practical Inorganic Chemistry
2.	Course Number	0303326
3.	Credit Hours (Theory, Practical)	1+2
	Contact Hours (Theory, Practical)	1 (theory) + 5 practical hrs/week
4.	Prerequisites/ Corequisites	0303321+0303106
5.	Program Title	B.Sc. Chemistry
6.	Program Code	0303
7.	School/ Center	The University of Jordan
8.	Department	Science
9.	Course Level	Chemistry
10.	Year of Study and Semester (s)	Second Year
11.	Other Department(s) Involved in Teaching the Course	3rd Year Students/2nd semester 2023-2024
12.	Main Learning Language	English
13.	Learning Types	☒Face to face learning ☐Blended ☐Fully online
14.	Online Platforms(s)	☐Moodle ☒Microsoft Teams
15.	Issuing Date	6-8-2024
16.	Revision Date	6-8-2024

17. Course Coordinator:

Name: Dr. Murad A. AlDamen, Prof.
Office number: Chemistry 2nd floor
Email: maldamen@ju.edu.jo
Contact hours: 8:00-10:00 Mon. Wed.
Phone number:

18. Other Instructors:

Name:
Office number:
Phone number:
Email:
Contact hours:

19. Course Description:

This course focuses on the preparation and characterization of coordination complexes using various ligands such as oxalate, acetylacetonate, ethylene diamine, and acetate, among others. The curriculum also includes a series of lectures that delve into the theoretical aspects of inorganic synthesis and structure elucidation.

Upon successful completion of this course, students will be able to independently conduct the experimental preparation of coordination complexes. Additionally, students will gain proficiency in characterizing these complexes through techniques such as melting point determination, molecular weight analysis, room temperature magnetic measurements, conductance studies, and spectral analysis (including FTIR and UV).

20. Program Intended Learning Outcomes: (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

Upon successful completion of this course, students will be able to:

SO-1. **Problem Solving**: Graduates will be able to apply mathematical and scientific knowledge to identify, formulate, and solve technical or scientific problems relevant to the discipline of chemistry.
SO-2. **Design**: Graduates will be able to use their understanding of chemistry concepts and principles to formulate and design systems, processes, procedures, or programs to meet desired goals and outcomes.
SO-3. **Experimental Skills**: Graduates will be able to design, conduct, and analyze experiments or test hypotheses, utilizing appropriate chemical techniques and scientific judgment to draw meaningful conclusions.
SO-4. **Communication**: Graduates will be able to communicate scientific information effectively and accurately to a range of audiences, including both technical and non-technical audiences.
SO-5**. Ethics and Global Context**: Graduates will understand and apply ethical and professional responsibilities in the context of the impact of technical and scientific solutions on global, economic, environmental, and societal issues.
SO-6. **Teamwork**: Graduates will be able to work effectively as part of a team, establishing goals, planning tasks, meeting deadlines, and analysing risk and uncertainty in the context of chemistry-related projects and initiatives.
SO-7. **Handling Chemicals**: An ability to apply the proper procedures for safe handling of chemicals.

21. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

CLO1: **Apply Inorganic Chemistry Concepts**: Utilize theoretical concepts and models from inorganic chemistry to analyze and solve practical laboratory problems effectively.

CLO2: **Master Laboratory Procedures**: Demonstrate proficiency in common techniques and procedures used in inorganic chemistry laboratories, including the preparation and handling of chemical substances.

CLO3: **Handle Tools Safely and Effectively**: Safely and accurately use laboratory equipment and instruments to obtain precise measurements and spectra, adhering to best practices.

CLO4: **Analyze and Compare Experimental Data**: Systematically organize and analyze experimental results, comparing findings with literature data to draw meaningful conclusions.

CLO5: **Develop Comprehensive Laboratory Reports**: Craft detailed and coherent reports for each practical session, including clear descriptions and interpretations of experimental work and results.

CLO6: **Adhere to Safety and Waste Management Protocols**: Independently apply laboratory safety protocols and waste management practices to ensure a safe and environmentally responsible working environment.

CLO7: **Communicate Scientific Findings**: Extract and articulate relevant conclusions about experimental methods and product characterization, and effectively communicate laboratory work through both oral presentations and written reports.

CLOs	The learning levels to be achieved					
	Remembering	**Understanding**	**Applying**	**Analysing**	**evaluating**	**Creating**
1	☑		☑			
2		☑				
3		☑	☑	☑		
4		☑	☑	☑	☑	
5		☑	☑	☑	☑	
6		☑	☑			
7		☑	☑	☑	☑	☑

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

#CLOs	SO(1)	SO(2)	SO(3)	SO(4)	SO(5)	SO(6)	SO(7)
1	☑	☑					
2	☑	☑	☑			☑	
3			☑			☑	
4			☑	☑			
5					☑		
6							☑
7					☑		

23. Topic Outline and Schedule:

Week	Lecture	Topic	CLO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
1	Lecture 1	Introduction and safety rules	1, 6	F-to-F			F O	M/S
	Lab. 1	EXP1 Cr acetylacetonate and its derivatives	all	F-to-F			F R/O	M/S
2	Lecture 2	Molar conductance	2,3	F-to-F			F O	M/S
	Lab. 2	EXP1 characterization	all	F-to-F			F R/O	M/S
3	Lecture 3	Molar mass determination	2,3	F-to-F			F O	M/S
	Lab. 3	EXP1 characterization	all	F-to-F			F R/O	M/S
4	Lecture 4	Magnetic measurements	2,3	F-to-F			F O	M/S
	Lab. 4	EXP2 Cr/Co coordination isomerism/characterization	All	F-to-F			F R/O	M/S
5	Lecture 5	Introduction to spectroscopy	2,3	F-to-F			F O	M/S
	Lab. 5	EXP3 Cr/Co oxalate/characterization	All	F-to-F			F R/O	M/S
6	Lecture 6	UV-visible spectra 1	2,3	F-to-F			F O	M/S
	Lab. 6	EXP6 Ni acetylacetonate complexes/ characterization	All	F-to-F			F R/O	M/S
7	Lecture 7	UV-visible spectra 2	2,3	F-to-F			F O	M/S
	Lab. 7	EXP7 cobalt penta/hexamine/ characterization	All	F-to-F			F R/O	M/S
8	Lecture 8	UV-visible spectra 3	2,3	F-to-F			F O	M/S
	Lab. 8	EXP8 $Fe(ox)_3$/ characterization	All	F-to-F			F R/O	M/S
9	Lecture 9	FTIR measurements	2,3	F-to-F			F O	M/S
	Lab. 9	EXP9 different acac complexes/characterization	All	F-to-F			F R/O	M/S
10	Lecture 10	Thermodynamic aspects of synthesis	2,3	F-to-F			F O	M/S
	Lab. 10	EXP10 different acac complexes/characterization	All	F-to-F			F R/O	M/S
11	Lecture 11	Kinetic aspects of synthesis	2,3	F-to-F			F O	M/S
	Lab. 11	EXP11 different acac complexes/characterization	All	F-to-F			F R/O	M/S
12	Lecture 12	Lab work discussion 1	4,5	F-to-F			F O	M/S
	Lab. 12	EXP12 different acac complexes/characterization	All	F-to-F			F R/O	M/S
13	Lecture 13	Lab work discussion 2	4,5	F-to-F			F O	M/S
	Lab. 13	EXP13 further characterization	All	F-to-F			F R/O	M/S
14	Lecture 14	Lab work discussion 3	4,5,7	F-to-F			F O	M/S
	Lab. 14	EXP14 further characterization and product checkin	all	F-to-F			F R/O	M/S

R = report, O = oral exam, F = final written exam, F-to-F = face to face, M/S manual/lecture slides

24. Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	CLO/s Linked to the Evaluation activity	Period (Week)	Platform
Report + product quality	30	All experiments	All	At the end of each exp.	In lab
Oral Exam (MID)	20	First 5 experiments	1,2,3,6	After 5 performing experiments	In lab
Work evaluation	10	All experiments	All	After performing all experiments	In lab
Final (written)	40	All experiments	1,2,4,7	At the end of semester	-

25. Course Requirements:

The laboratory is provided with all required equipment

26. Course Policies:

A- Attendance policies: All students are expected to follow the of attendance policies of the University of Jordan,
absences exceeding 15% of total number of class meeting (2 labs) will result in F grade or course drop.
B- Absences from exams and handing in assignments on time: University rules and regulations regarding make-up exams.
C- Health and safety procedures: see MSDS instructions.
D- Honesty policy regarding cheating, plagiarism, misbehavior: University rules and regulations.
E- Grading policy: University rules and regulations
F- Available university services that support achievement in the course: N/A

27. References:

We upload on google drive a dynamic manual, this will help the students to participate in modifying the experiments and optimize the reactions:
https://docs.google.com/document/d/1rfXDWAeP5iB_xht-yu_kR1KXCUYFumlkMQ-ba1yEAWU/edit?usp=sharing

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3.Charles, R.G. (1963) Inorganic Synthesis 7, 183-184.
4.Collman, J.P. (1965). Angew. Chem. Int. Ed. 4, 132-138.
5.Collman, J.P. Goldby, S., Young, W.L. III & Marshall, R. (1962). Inorg. Chem. 1, 704-710.
6.Collman, J.P., Young, W.L. III & Kauffman, G.B. (1963). Inorg. Synth. 7, 205-207.
7.Combes, C.R., (1890). Acad. Sci., iii 272.
8.Goodgame, D.M.L. et. al, (1965), Inorg. Chem. 4, 823.
9. Szafran,Zvi;Pike,R.M and Singh,M,M,Wiley(1991).
10. SciFinder® at elibrary.ju.edu.jo

28. Additional information:

Project acac minibook and the updated Lab manual

Name of the Instructor or the Course Coordinator: **Dr. Murad AlDamen, Prof.** Signature: Date: 26-8-2024

Name of the Head of Quality Assurance Committee/ Department **Dr. Haytham Saadeh, Prof.** Signature: Date:

Signature: Date:

Name of the Head of Department
Dr. Firas Awwadi, Prof.

Signature: Date:

Name of the Head of Quality Assurance Committee/ School or Center
Dr. Murad A. AlDamen, Prof.

Signature: Date:

Name of the Dean or the Director
Dr. Mahmoud I. Jaghoub, Prof.