

نموذج توصيف مقرر
Course Description Form

Name of College\Faculty :

اسم الكلية:

Name of Department:

اسم القسم العلمي:

Course Name	Inorganic and Organometallic Chemistry Laboratory	اسم المقرر
Course No.	441	رقم المقرر
No. of Credits	3	عدد الوحدات
Theoretical Hours	2 hours/week	عدد الساعات النظرية
Practical Hours	3 hours/week	عدد الساعات المحلّية
Course topics		مواضيع المقرر
- Synthesis of $[\text{Co}(\text{NH}_3)_4\text{CO}_3]\text{NO}_3$. - Synthesis of $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$. - Characterization of $[\text{Co}(\text{NH}_3)_4\text{CO}_3]\text{NO}_3$ and $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$. - Synthesis and characterization of linkage isomers: $[\text{Co}(\text{NH}_3)_5\text{ONO}]\text{Cl}_2$ and $[\text{Co}(\text{NH}_3)_5\text{NO}_2]\text{Cl}_2$. - Synthesis, characterization, and resolution of enantiomers of $[\text{Co}(\text{en})_3]^{3+}$. - Preparation of $\text{Ru}(\text{bpy})_3^{2+}$ light-emitting complex (LED). - Synthesis of an air-sensitive compound: copper(I) chloride. - Synthesis and characterization of a high-temperature superconductor: $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$.		
Text book: (Name, Author , Year , Publisher)		عنوان الكتاب : (الاسم ، المؤلف ، سنة الطبع ، دار النشر)
There is no required textbook for this laboratory course.		
Lab Resources: Laboratory handouts and instructional materials is provided by the instructor.		

References: (Name , Author , Year . Publisher)	عنوان المرجع : (الاسم ، المؤلف ، سنة الطبع ، دار النشر)
No References	

Prerequisites CHEM 338				متطلبات المقرر	
Grading	Exams	25	%	الاختبارات	آلية رصد المقرر
	Quizzes		%	امتحانات قصيرة	
	H.W.		%	واجبات	
	Project (field study)	35	%	مشاريع (دراسة ميدانية)	
	Final	40	%	الاختبار النهائي	
	100 %				

Course objectives					
No.	Course Objectives (Learning Outcomes)	Example(s) of relevant (Topics and activities)	Recommended Level to satisfy the objectives		
			High	Medium	Low
1	Prepare the coordination compounds $[\text{Co}(\text{NH}_3)_4\text{CO}_3]\text{NO}_3$ and $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$ via ligand substitution reactions.	Synthesis of $[\text{Co}(\text{NH}_3)_4\text{CO}_3]\text{NO}_3$; Synthesis of $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$; Characterization of $[\text{Co}(\text{NH}_3)_4\text{CO}_3]\text{NO}_3$ and $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$.	X		
2	Using various techniques to prepare interesting complexes such as glassblowing, air sensitive techniques.	Synthesis of an air-sensitive compound: copper(I) chloride; Synthesis and characterization of a high-temperature superconductor ($\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$); Laboratory sessions involving specialized techniques and handling sensitive materials.	X		



3	Using different instruments for characterizing	Characterization of $[\text{Co}(\text{NH}_3)_4\text{CO}_3]\text{NO}_3$ and $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$; Synthesis and characterization of linkage isomers $[\text{Co}(\text{NH}_3)_5\text{ONO}]\text{Cl}_2$ and $[\text{Co}(\text{NH}_3)_5\text{NO}_2]\text{Cl}_2$; Characterization of high-temperature superconductor $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$.	X		
4	Magnetic susceptibility measurements of transition metal containing compounds.	Characterization of $[\text{Co}(\text{NH}_3)_4\text{CO}_3]\text{NO}_3$ and $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$; Synthesis and characterization of linkage isomers; Characterization of coordination complexes with magnetic and electronic properties.	X		
5	Prepare and characterize organometallic compounds.	Preparation of $\text{Ru}(\text{bpy})_3^{2+}$ light-emitting complex (LED); Synthesis and characterization of a high-temperature superconductor ($\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$).	X		
Fields	Inorganic and Organometallic Chemistry				
Skills	• Ability to synthesize and isolate coordination and organometallic compounds. • Competence in performing ligand substitution, isomerization, and redox reactions. • Proficiency in using laboratory instruments for compound characterization (UV-Vis, IR, magnetic susceptibility) • Skill in handling air-sensitive and moisture-sensitive materials safely. • Ability to record, analyze, and interpret experimental data accurately.				



	• Development of laboratory notebook documentation and report-writing skills	
Coordinator (Name and Rank) :	Convener of the Inorganic and Analytical Chemistry group	
Signature and stamp :		
Date:	8\ 11 \2025	