

نموذج توصيف مقرر
Course Description Form

Name of College\Faculty :Science

اسم الكلية:

Name of Department:

Chemistry

اسم القسم العلمي:

Course Name	ADVANCED TECHNIQUES IN INORGANIC CHEMISTRY	اسم المقرر
Course No.	CHEM 443	رقم المقرر
No. of Credits	3	عدد الوحدات
Theoretical Hours	3	عدد الساعات النظرية
Practical Hours	0	عدد الساعات المحلّية
Course topics		مواضيع المقرر
1. Magnetic properties of complexes. 2. Nuclear magnetic resonance in coordination compounds. 3. Electron paramagnetic resonance spectroscopy and its application in coordination chemistry. 4. Nuclear quadruple resonance. 5. X-ray structural analysis of complexes. 6. Mössbauer spectra of complexes. 7. Thermal analysis and its applications in inorganic chemistry. 8. Mass spectrometry.		
Text book: (Name, Author , Year , Publisher)		عنوان الكتاب : (الاسم ، المؤلف ، سنة الطبع ، دار النشر)
Physical methods in chemistry by R.D. Drago, latest edition, Reinhold. Techniques in inorganic chemistry edited by John P. Fackler, latest edition, Taylor & Francis.		
References: (Name , Author , Year . Publisher)		عنوان المرجع : (الاسم ، المؤلف ، سنة الطبع ، دار النشر)
Electron Spin Resonance by C.P. Poole, latest edition, John Wiley & Sons. Structural methods in inorganic chemistry by E.A.V. dsworth, latest edition, Blackwell Scientific. Structural methods in molecular inorganic chemistry by D. W. H. Rankin, latest edition, Wiley.		

Prerequisites		متطلبات المقرر			
	Exams		%	40	الاختبارات

Grading	Quizzes		%	5	امتحانات قصيرة	آلية رصد المقرر
	H.W.		%	5	واجبات	
	Project (field study)		%	10	مشاريع (دراسة ميدانية)	
	Final		%	40	الاختبار النهائي	
	%100					

Textbook Chapters

Chapter	Title	Section Excluded
2	X-Ray Powder Diffraction Characterization of Polymeric Metal Diazolates	-
3	Single Crystal Neutron Diffraction for the Inorganic Chemist	-
5	NMR Techniques for Investigating the Supramolecular Structure of Coordination Compounds in Solution	-

Course objectives					
No.	Course Objectives (Learning Outcomes)	Example(s) of relevant (Topics and activities)	Recommended Level to satisfy the objectives		
			High	Medium	Low
1	understand the origin of the magnetic properties of certain inorganic compounds	Magnetic properties of complexes	✓		
2	understand the basic concepts of NMR and its application in inorganic compounds	Nuclear quadruple resonance	✓		
3	describe the basic concepts of ESR and its applications for structural determination of coordination compounds	Nuclear magnetic resonance in coordination compounds. Electron paramagnetic resonance spectroscopy and	✓		



		its application in coordination chemistry			
4	define the theoretical basis of nuclear quadruple resonance and illustrate some of NQR in inorganic compounds containing ^{75}As , ^{10}B , ^{109}Bi , ^{35}Cl	Nuclear quadruple resonance	✓		
5	outline the principles of X-ray interference and neutron diffraction and analyze the experimental spectra for structural determination of metal complexes	X-ray structural analysis of complexes	✓		
6	apply the Mössbauer spectra to investigate the validity of Pauling's electronegativity principles for inorganic complexes containing Sn, Ru and Np.	Mössbauer spectra of complexes	✓		
7	apply the thermos analytical methods on studying the thermal characters of coordination compounds and inorganic salts	Thermal analysis and its applications in inorganic chemistry	✓		
8	define the theoretical concepts of mass spectrometry	Mass spectrometry	✓		
9	outlines the applications of the mass spectrometry for molecular weight determination	Mass spectrometry	✓		
Fields					
Skills					
Coordinator (Name and Rank) :					
Signature and stamp :					
Date:	9\ 11 \2025				