

نموذج توصيف مقرر
Course Description Form

Name of College\Faculty : **Science**

Name of Department: **Chemistry**

اسم الكلية:

اسم القسم العلمي:

Course Name	General and Analytical Chemistry for Engineering Students			اسم المقرر
Course No.	0420-208			رقم المقرر
No. of Credits	4 (3-3-4)			عدد الوحدات
Theoretical Hours	3			عدد الساعات النظرية
Practical Hours	3			عدد الساعات المحلّية
Course topics: مواضيع المقرر				
Introduction to gases, properties of solutions, chemical equilibrium, acid-base and solubility equilibria, introduction to separation techniques, electrochemistry, and the basic concepts of the classical and simple instrumental methods of analysis and their applications.				
Text book: (Name, Author , Year , Publisher)		عنوان الكتاب : (الاسم ، المؤلف ، سنة الطبع ، دار النشر)		
1- Chemistry, Raymond Chang, latest edition, McGraw Hill, NY . 2- Fundamental of Analytical Chemistry, Douglas Skoog, latest edition, Cengage.				
References: (Name , Author , Year . Publisher)		عنوان المرجع : (الاسم ، المؤلف ، سنة الطبع ، دار النشر)		
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Prerequisites					متطلبات المقرر
CHEM 101 + CHEM 105					
Grading	Exams	20	%		الاختبارات
	Quizzes	0	%		امتحانات قصيرة
	H.W.	0	%		واجبات
	Practical	30	%		العملي
	Tutorial	10	%		حل مسائل
					آلية رصد المقرر

	Project (field study)	0	%		مشاريع (دراسة ميدانية)
	Final	40	%		الاختبار النهائي
	100%				

Chapters included

General chemistry	Chapter number	Topic	Section excluded
	5	Gases	
	12	Properties of solutions	12.8
	14	Chemical Equilibrium	
	15	Acids and bases	15.8
	16	Acid-based equilibrium and solubility equilibria	16.10 – 16.11
	18	Electrochemistry	19.6 – 19.7
Analytical chemistry	17	Complexation and Precipitation Reactions and Titrations	17D - 9
	19	Applications of Standard Electrode Potentials	
	21	Potentiometry	
	24	Introduction to Spectrochemical Methods	24D – 24D-2
	31	Introduction to Analytical Separations	31E-6, 31E-8

Course objectives					
No.	Course Objectives (Learning Outcomes)	Example(s) of relevant (Topics and activities)	Recommended Level to satisfy the objectives		
			High	Medium	Low
1	To understand properties and laws of gases and their chemical equilibrium	Gas laws, the ideal gas equation, stoichiometric relationships, partial pressures, and the kinetic molecular theory	H		
2	To recognize the physical properties of solution	Nature of solutions, their formation, concentration measures, factors affecting solubility, and colligative	H		



		properties for both nonelectrolyte and electrolyte solutions			
3	To apply chemical equilibrium to acid-base and precipitation reactions	Chemical equilibrium, how to express and interpret the equilibrium constant, and the factors that influence equilibrium	H		
4	To understand acid-base and solubility equilibria and acid-base titrations	Brønsted and Lewis definitions, water's properties, pH, strengths of acids and bases, ionization constants, conjugate relationships, and acid-base behavior of salts		M	
5	To understand complexation and precipitation titrations	Precipitation titrations, the role of indicators in detecting endpoints, and complexometric titrations used for determining metal ions		M	
6	To introduce analytical separation techniques	Chromatography is widely used to analyze complex samples by exploiting differences in molecular affinities and movement		M	
7	To introduce electrochemistry and electrical methods of analysis	Principles of redox reactions, the operation of galvanic cells,		M	



		standard reduction potentials, thermodynamic aspects, the influence of concentration on cell emf, and the process of electrolysis			
8	To introduce spectroscopic methods of analysis	The interaction of electromagnetic radiation with matter through absorption and emission forms the basis for applying Beer's Law in quantitative analysis using calibration curves		M	
9	To be familiar with basic instrumentations used in analytical chemistry lab	To develop practical skills in using basic analytical chemistry instruments and techniques, including column chromatography, titration, and UV-Vis spectroscopy and others	H		
Fields	Analytical chemistry				
Skills					
Coordinator (Name and Rank):	Inorganic and Analytical Chemistry Convenor				
Signature and stamp:					
Date:	4-11-2025				