جامعة : المنصورة

كـــلية : العلوم

قسم / الكيمياء

توصيف مقرر دراسى

١-بيانات المقرر		
الرمز الكود :ك٤١١	**أسم المقرر:** spectrophotometric analysis and analysis of raw materials	**المستوى : الرابع**
البرنامج : الكيمياء	**عدد الوحدات الدراسية: ٢ نظرى : ٢ تمارين: ١ عملى:-**	

٢- هدف المقرر:	**For students undertaking this course, the aims are to:** • Introduce the basic information of spectra of organic compounds. • Introduce the principles of analysis of organic and inorganic compounds. • Study the methods of analysis of ores and how to purify it. • Study the physical and chemical properties of organic compounds by several techniques. • Introduce the principles of X-ray, NMR, IR, and MS spectrometry. Acquire students the skills of using IT and communication technology and using scientific literature and preparing technical reports.
٣- المستهدف من التدريس المقرر:	
أ-المعلومات والمفاهيم:	**a- Knowledge and Understanding :** **On completing this course, students will be able to:** a1- define the basic information of different method of spectroscopy. a2- explain the general methods used for structure of elucidation of different compounds. a3- list the different function groups in the compounds. a4- state the different classes of elements found in its ores and defined the meaning of preconcentration
ب-المهارات الذهنية	**b- Intellectual Skills: On completing this course, students will be able to:** b1- apply analysis rules to get the true structure of the compounds. b2- apply the student to use different techniques with wide applications.

b3- outline suitable methods of analysis to recognize the compounds.	
c-Professional and Practical Skills: On completing this course, students will be able to: c1- prepare technical report using scientific literature. c2- Solve problems using a range of formats and approaches.	**ج- المهارات المهنية** **الخاصة بالمقرر:**
d-General and Transferable Skills: On completing this course, students will be able to: d1- Use IT and web search engines for collecting information.	**د- المهارات العامة :**
Spectrochemical analysis • Survey of spectrochemical methods • Instrumentation-application • Atomic spectroscopy atomic fluorescence and x-ray fluorescence spectroscopy applications Applied spectroscopy: • IR spectroscopy-theory-units for hooks low-relation between wave number and the following factors: bond energy, bond length, electronegativity, s-character, ring sizes, conjugation, conformational analysis, mechanical coupling-vibration modes in polyatomic molecules, stretching vibration, bending vibration. • UV and visible spectroscopy-theory-absorption law-chromophores and auxochrome-bathochromic effect - hypochromic effect hypochromic effect-Woodward rules of conjugated dienes, α,β-unsaturated ketones, aromatic carbonyl compounds and polyenes-resonance in excited state, resonance in ground state, ketones and aldehydes-effect of pH-hydrogen bond, steric inhibition of conjugation-solvent correlation. • NMR spectroscopy-theory-chemical shift-spin-spin coupling-integration - factors affecting chemical shift-inductive effect, anizotropic effect, Van der Wall effect, resonance, solvents, temperature, concentration, hydrogen bond • MS spectrometry-theory and instruments-fragmentation rules (9 rules) • Examples -structure elucidation using 4 spectra, IR, UV, NMR & MS. Ore analysis and allied materials • Concentration of ores-sampling-choice of method • Solution of the sample-preconcentration of traces • Selective methods for the analysis of some elements-examples for complete analysis of some ores • Processes, instruments and automated analysis Applied inorganic chemistry: • Raw materials- basic laws of chemical technology • Basic types of processes- manufacture of inorganic chemical products	**٤- محتوى المقرر:**

Metal extraction - fuel cells.

٥- اساليب التعليم والتعلم:

5.1 - Lectures.

5.2 – Tutorial

5.3 - Home works, reports and discussion groups

٦- أساليب التعليم والتعلم للطلاب ذوى القدرات المحدودة:

The same as normal students, only skeletal disabilities are allowed in the Faculty of Science.

٧- تقويم الطلاب :

أ- الأساليب المستخدمة :

7- Student Assessment Methods

Final exam	**to assess**	a1-a4, b1-b3,c2
Oral exam	**to assess**	a1-a4, b1-b3
Mid-term exam	**To assess**	a1-a4, b1-b3
Report	**to assess**	c1,d1

ب- التوقيت :

Assessment Schedule

Assessment 1	**Week #final exam**	**Week 14**
Assessment 2	**Week #oral exam**	**Week 14**
Assessment 3	**Week #mid-term exam**	**Week 4,8,12**
Assessment 4	**Week #report**	**Week 10**

ج- توزيع الدرجات :

Weighting of Assessments

Final-Term Examination	**80%**
Oral Examination	**10%**
Practical Examination	**0%**

	Semester work	**0%**	
	Mid-term examination	**10%**	
	Other types of assessment	**0%**	
	Total	**100%**	

٨- قائمة الكتب الدراسية والمراجع :

أ- مذكرات:	Spectrochemical analysis, applied spectroscopy, ore analysis, and applied Inorganic
ب- كتب ملزمة	
ج- كتب مقترحة :	Organic Spectroscopy, Lal Dhar Singh Yadav, Springer; 1 edition (2005) Comprehensive Inorganic Chemistry. Sulekh Chandra, New Age International Limited Publishers, New Delhi, (2004) Daniel C. Harris, Quantitative Chemical Analysis, W. H. Freeman; Eighth Edition edition (2010)
د- دوريات علمية أو نشرات..	http://www.oup.com/uk/orc/bin/9780199264636/

مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

المحتويات للمقرر	أسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
Spectrochemical analysis					
• Survey of spectrochemical methods	1-4	a1,a2	b1,b2		
• Instrumentation-application	5-8	a1,a2	b1,b2		
• Atomic spectroscopy atomic fluorescence and x-ray fluorescence spectroscopy applications	9-13	a1,a2	b1,b2	c1	d1

Applied spectroscopy:					
• IR spectroscopy-theory-units for hooks low-relation between wave number and the following factors: bond energy, bond length, electronegativity, s-character, ring sizes, conjugation, conformational analysis, mechanical coupling-vibration modes in polyatomic molecules, stretching vib, bending vib.	1-2	a1,a2,a3	b1,b2	c2	
• UV and visible spectroscopy-theory-absorption law-chromophores and auxochrome-bathochromic effect - hypochromic effect hypochromic effect-Woodward rules of conjugated dienes, α,β-unsaturated ketones, aromatic carbonyl compounds and polyenes-resonance in excited state, resonance in ground state, ketones and aldehydes-effect of pH-hydrogen bond, steric inhibition of conjugation-solvent correlation.	3-5	a1,a2,a3	b1,b2	c2	
• NMR spectroscopy-theory-chemical shift-spin-spin coupling-integration - factors affecting chemical shift-inductive effect, anizotropic effect, Van der Wall effect, resonance, solvents, temperature, concentration, hydrogen bond	6-8	a1,a2,a3	b1,b2	c2	
• MS spectrometry-theory and instruments-fragmentation rules (9 rules)	9-10	a1,a2	b1,b2	c2	
• Examples -structure elucidation using 4 spectra, IR, UV, NMR & MS.	11-13	a1,a2	b1,b2	c2	
Ore analysis and allied materials					
• Concentration of ores-sampling-choice of method	1-3	a4	b3		
• Solution of the sample-preconcentration of traces	4-6	a4	b3		

• Selective methods for the analysis of some elements- examples for complete analysis of some ores	7-9	a4	b3	c1	d1
• Processes, instruments and automated analysis	10-13	a4	b3	c1	d1
Applied inorganic chemistry:					
• Raw materials- basic laws of chemical technology	1-4	a4	b2		
• Basic types of processes- manufacture of inorganic chemical products	5-8	a4	b2	c1	d1
• Metal extraction - fuel cells.	9-13	a4	b2	c1	d1

أستاذ المادة : أ.د./أحمد محمد مبروك الوكيل

رئيس مجلس القسم العلمي : أ.د /سالم السيد سمرة