جامعة : المنصورة

كـــلية : العلوم

قسم / الكيمياء

توصيف مقرر دراسى

١- بيانات المقرر		
الرمز الكود :ك٤٣١	**أسم المقرر photochemistry: chemical spectroscopy**	**المستوى : الرابع**
البرنامج : الكيمياء	**عدد الوحدات الدراسية: ٣ نظرى : ٢ تمارين: ٠ عملى:٣**	

٢- هدف المقرر:	**For students undertaking this course, the aims are to:** 1 - Introduction of some basic concepts of photochemistry. 2 - Introduction of some basic concepts of applied spectroscopic measurements.
٣- المستهدف من التدريس المقرر:	
أ-المعلومات والمفاهيم:	**a- Knowledge and Understanding :** a - 1 - identify the basic concepts of photochemistry. a - 2 - explain the main theories and laws of photochemistry. a - 3 - illustrate the applications of photochemistry. a - 4 - identify the basic concepts of spectroscopy. a - 5 - explain the main theories and laws of spectroscopy. a - 6 - illustrate the applications of spectroscopic measurements. **On completing this course, students will be able to:**
ب-المهارات الذهنية	**b- Intellectual Skills: On completing this course, students will be able to:**

b - 1 - apply photochemistry laws. b - 2 - distinguish different types of photochemistry. b - 3 - interpretations the mechanisms of photochemistry b - 4 - apply spectroscopic laws. b - 5 - distinguish different types of spectroscopy. b - 6 - interpretations the spectroscopy data of organic compounds.	
c-Professional and Practical Skills: On completing this course, c - 1 - handle chemicals and deferent light sources laboratory procedures safely. c - 2 - photosynthesis of some deferent reactions. c - 3 - separate, purify the photoproducts. c - 4 - identify the chemical structures by spectroscopic methods. c - 5 - solve problems and suggesting its reaction mechanisms. **students will be able to:**	**ج- المهارات المهنية الخاصة بالمقرر:**
d-General and Transferable Skills: On completing this course, d - 1 - work effectively on solving problems. d - 2 - work in groups effectively. **students will be able to:**	**د- المهارات العامة :**
1- Part I Photochemistry 1h/W: Introduction: excitation and the excited state 2- Intramolecular reactions of the olefinic bond: geometrical isomerism – cyclization reactions of conjugated olefins 3- rearrangements – 1,4-dienes and the di-?-methane rearrangement 4- rearrangements – 1,5-dienes and the sigmatropic reaction 5- Intramolecular reactions of the carbonyl group: saturated acyclic and side chain carbonyl compounds 6- saturated cyclic carbonyl compounds	**٤- محتوى المقرر:**

7- unsaturated carbonyl compounds cyclohexadienones 8- Intermolecular cycloaddition reactions 9- Oxidation, reduction substitution and elimination reactions: Incorporation of molecular oxygen 10- oxidative coupling – reduction reactions – substitution reactions 11- Molecular rearrangements involving elimination and substitution – formation of reactive intermediates by molecular elimination, and revision. 12- Part II Spectroscopy 1h/W: Short introduction to basic principles and methods: IR, UV, MS & NMR 13- NMR (chemical shift – spin spin coupling – coupling constants – spin decoupling 14- Recognition of structural fragments by NMR: functional groups (1H chemical shifts, Deuterium exchange 15- 13C chemical shifts,15N chemical shifts 16- relative configuration and conformation (HH coupling constants, CH coupling constants, NH coupling constants 17- Problems: application of one-dimensional 1H NMR spectra 18- Temperature dependent 1H and 13C NMR spectra 19- Application of one-dimensional 1H NMR spectra 20- Application of 1H and 13C NMR spectra to different macromolecules (heterocycles, natural products, proteins).Practical: 3h/W	
1 - Active learning in lectures using data show and board 2 - Home works, reports and discussion groups 3 - Lab work.	٥- اساليب التعليم والتعلم:
The same as normal students, only skeletal disabilities are allowed in the Faculty of Science.	٦- أساليب التعليم والتعلم للطلاب ذوى القدرات المحدودة:
	٧- تقويم الطلاب :
7- Student Assessment Methods	أ- الأساليب المستخدمة :

Practical exam	**To assess**	c1-c4,d2		
Final exam	**to assess**	a1-a3, A4-6, b1-b3, B4-6, c5,d1		
Oral exam	**to assess**	a1-a3, A4-6, b1-b3, B4-6, c5,d1		
Mid-term exam	**To assess**	a1-a3, A4-6, b1-b3, B4-6, c5,d1		

ب- التوقيت :

Assessment Schedule

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

ج- توزيع الدرجات :

Weighting of Assessments

Final-Term Examination	**60%**
Oral Examination	**10%**
Practical Examination	**20%**
Semester work	**0%**
Mid-term examination	**10%**
Other types of assessment	**0%**
Total	**100%**

٨- قائمة الكتب الدراسية والمراجع :

أ- مذكرات:

1 - Photochemistry & Spectroscopy

ب- كتب ملزمة	
ج- كتب مقترحة :	1 - Introduction of organic photochemistry, John D. Coyle, John Wiley & Sons Ltd, 1989 2 - Excited state and photochemistry of organic molecules, Martin Klessing and Josef Michl, VCH Publishers, 1995. 3 - Applied Spectroscopy, Jerry Workman & Art W Springcteen, Elsevier Inc. 1998. 4 - Modern NMR Spectroscopy, Jeremy KM Sanders, Edwin C Constable, Brian K Hunter & Clive M Pearce, Oxford Univ. Press, Oxford, New York, Toronto, 1993
د- دوريات علمية أو نشرات..	1 - www.chemweb.com

مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

المحتويات للمقرر	أسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
Part I, Photochemistry:					
Introduction: excitation and the excited state - Intramolecular reactions of the olefinic bond: geometrical isomerism – cyclization reactions of conjugated olefins	1-2	1-4		c5	d1
rearrangements – 1,4-dienes and the di-?-methane rearrangement - rearrangements – 1,5-dienes and the sigmatropic reaction	3-4	5-7		c5	d1
Intramolecular reactions of the carbonyl group: saturated acyclic and side chain carbonyl compounds	5	8-10		c5	
saturated cyclic carbonyl compounds - unsaturated carbonyl compounds	6-7	11-12	a4-a5	c5	d1

cyclohexadienones					
Intermolecular cycloaddition reactions - Oxidation, reduction substitution and elimination reactions: Incorporation of molecular oxygen	8-9	13-14	a5	c5	d1
oxidative coupling – reduction reactions – substitution reactions	10-11	2-11	a5-a6	c5	d1
Molecular rearrangements involving elimination and substitution – formation of reactive intermediates by molecular elimination, and revision.	12-14	1-4		c5	d1
Part II Spectroscopy:					
Short introduction to basic principles and methods: IR, UV, MS & NMR - NMR (chemical shift – spin spin coupling – coupling constants – spin decoupling	1-4	a4-a5			
Recognition of structural fragments by NMR: functional groups (1H chemical shifts, Deuterium exchange - 13C chemical shifts - 15N chemical shifts	5-7	a5		c5	d1
relative configuration and conformation (HH coupling constants, CH coupling constants, NH coupling constants - Problems: application of one-dimensional 1H NMR spectra	8-10	a5-a6			
Temperature dependent 1H and 13C NMR spectra - Application of one-dimensional 1H NMR spectra	11-12	a5-a6			
Application of 1H and 13C NMR spectra to different macromolecules (heterocycles, natural products, proteins).	13-14	a6			
Practical: Photosynthesis of deferent types of photochemical reactions and	2-11			c2,c3,c4	d2

some photo applications.					

أستاذ المادة : ا.د/ محمد محمود محمد أبوالذهب

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