



Course specification

University/Academy: Damanhour University

Faculty/Institute: Science

Department: Chemistry

1. course Data:

Course code: Chem. 405	Course title: PHYSICAL ORGANIC CHEMISTRY 2	Academic year/level: 2010-2011 Fourth year /1 st term
Specialization: Special Chemistry	No. of instructional units: lecture <input type="text" value="4hrs/week"/> practical <input type="text" value="0 hrs/week"/>	

2. course Aim

By the end of this course, students should be able to:

- Understand the methods of investigation of reaction mechanisms, Energy considerations and stereochemical considerations.
- Realize the isotope effects and the steady approximation.
- Recognize reaction intermediates, symmetry controlled reactions and kinetics.
- Use the applications of aromatic substitutions and elimination reactions.
- Recognize the principles of organic photochemistry, molecular rearrangements and linear free energy relationship.

3. Intended learning outcome

a) Knowledge and understanding

By the end of this course, students should be able to:

- A1: Illustrate reaction mechanisms, energy considerations and stereochemistry.
- A2: describe reaction intermediate symmetry controlled reactions and kinetics.
- A3 illustrate substitution and elimination reactions.
- A4: Illustrate the principles of organic photochemistry, molecular rearrangements and linear free energy relationship.



b) Intellectual skills	By the end of this course, students should be able to: B1: Apply the reaction mechanisms, stereochemistry and kinetics in identification of organic reactions and preparation of new compounds. B2: Evaluate substitution and elimination reactions. B3: Describe principles of photochemistry, molecular rearrangements and energy relationship
c) Professional skills	By the end of the course, student will be able to: C1: dissect the reaction mechanisms, stereochemistry and kinetics in identification of organic reactions and preparation of new compounds.
d) General skills	D1: Use IT and web search engines for collecting information. D2: Work effectively in a team, and independently on solving organic chemistry problems. D3: Exchange ideas, principles and information by oral, written and visual means. D4: Communicate effectively with his lecturer and colleagues.
4. course content	Nonkinetic methods for the elucidation of reaction mechanism; stereochemical, isotope effects, isotope labelling, detection and structure determination of intermediates and products. Energetics of chemical reaction. Kinetics and thermodynamics of elementary and complex organic reactions. Medium effects. Mechanisms of nucleophilic and electrophilic substitution reactions (in aliphatic and aromatic systems) Application of HSAB principle, ambident nucleophiles. Mechanisms of reaction of carbonyl compounds, carboxylic acids derivatives. Linear free energy relationships. Reactivity selectivity principle. Mechanisms of elimination and addition reactions, stereoelectronic factors. Mechanisms of free radical reactions, detection, structure, stereochemical, kinetics of chain reactions, structure reactivity relationships, free radical substitution, - addition, -rearrangement and - fragmentation reactions. Carbenes, formation, structure, reactivities and mechanism of reactions. Intramolecular rearrangement symmetry controlled reactions, concerted reactions, electrocyclic, sigmatropic and cycloaddition reactions. Photochemistry, Photophysical processes, orbital symmetry consideration related to photochemical reactions, photochemistry of carbonyl compounds, alkenes, dienes and aromatic compounds.
5. Teaching and learning	4.1. Lectures and seminars using data show and board. 4.2. Reports and discussion groups.



methods											
6. teaching and learning methods for students with special needs	-----										
7. Student Assessment	<p>5.1. Mid term exam.</p> <p>5.2. Problems.</p> <p>5.3. Assignments.</p> <p>5.4 Written exam.</p>										
a) Procedures used:	-----										
b) Schedule:	<table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">Assessment 1: Mid term</td> <td style="text-align: right;">Week: 9</td> </tr> <tr> <td>Assessment 2: Final written</td> <td style="text-align: right;">Week: 16</td> </tr> </table>	Assessment 1: Mid term	Week: 9	Assessment 2: Final written	Week: 16						
Assessment 1: Mid term	Week: 9										
Assessment 2: Final written	Week: 16										
c) Weighing of Assessment:	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">Mid-Term Examination:</td> <td style="text-align: right;">0</td> </tr> <tr> <td>Final-Term Examination:</td> <td style="text-align: right;">200</td> </tr> <tr> <td>Semester Work:</td> <td style="text-align: right;">0</td> </tr> <tr> <td>Other types of assessment</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: right;">200</td> </tr> </table>	Mid-Term Examination:	0	Final-Term Examination:	200	Semester Work:	0	Other types of assessment	0	Total	200
Mid-Term Examination:	0										
Final-Term Examination:	200										
Semester Work:	0										
Other types of assessment	0										
Total	200										
8. List of Textbooks and References:	<p>6.1. Course Notes</p> <p>6.2. Essential Books (Text Books).</p> <ul style="list-style-type: none"> • Organic Chemistry, 4 th Eddition by Robert Wlorrison and Robert Boyd, Allyn and Bacon, Ir.c., Boston, London , Sydney, Toronto, 1983. • Organic Chemistry, 6 th Eddition by I. L. Finar, Longmann Group Limited, volume I and II 1975. • Basics in physical Organic chemistry, 4 th Edition by W.I. biter, London, 1988. • Fundamentals of spectroscopic methods, 2 th Edition ,1985. • Reaction mechanisms of organic chemistry, 9th edition, 2001. 6.3 										



	Recommended books. 6.4 Periodical and website
a) Course Notes	Course notes provided by the staff member of Math department, to be handed at the beginning of the semester.
b) Required Books (Textbooks)	None
c) Recommended Books	None
d) Periodicals, web sites,...,etc	-None

Course Instructor:

Head of Department: Dr. Medhat A. Shaker

1- Prof.Dr Adel Zaki Nasr

2- Dr.Mohamed Abd Ellatif Zein

Date: -----/-----/----