Course Specifications

Programme(s) on which the course is given: M.Sc.chemistry
Major or Minor element of programmes: major
Department offering the programme: Chemistry

Department offering the course: Chemistry

Academic year / Level: Postgraduate
Prerequisite: B.Sc. Chemistry

Date of specification approval: 2012

A- Basic Information

Title: Advanced physical organic chemistry
Code: CH6413
Credit Hours: 2 h Lecture: 1 -
Tutorial: 0 Practicals:0 Total: 2 h

B- Professional Information

1 – Overall Aims of Course
Upon the end of this course,

To understand different methods of molecular rearrangement of organic reaction, its temperature effect on equilibrium constant and activation energy. Study the intermediates of different organic reaction such as canezzaro and Hammentt reactions.

2 – Intended Learning Outcomes of Course (ILOs)

a- Knowledge and Understanding:

The student should be able to:
a1- Understand the different methods of molecular rearrangement.
a2- Studies the stability and energy level, equilibrium and rate of reaction.
a3- Recognize reaction intermediates, symmetry controlled reactions and kinetics.
a4- Use the applications of aromatic substitutions and elimination reactions.
a5- determine the intermediate of reaction mechanism and study of Hammett relationship .
b.Intellectual Skills
The student should be able to:
b1-Predict the molecular rearrangement of organic reaction.
b2-Suggest the equilibria, rates and mechanism of organic reaction.
b3-Interpret the reaction mechanism and kinetic evidence.

c.Professional and Practical Skills:

The students must be able to:
c1- Dissect the reaction mechanisms and kinetics in identification of organic reactions.

d.General and Transferable Skills: On completing this course, students will be able to:
d1-Search the internet for information and retrieve and evaluate information from different sources.
d2-Work as a member in a team
d3-Write laboratory reports and presentation of laboratory information.
d5-Implement efficient and effective working environment in different

3- Contents

Topic	No. of hours	Lecture	Tutorial/Practical
I. Molecular rearrangement: i. Rearrangement to electron-deficient atom. ii. Free-Radical and anionic rearrangement. iii. Orbital symmetry conderations.	6	3	
Med tearm	2	1	
II. Equilibra, rates and mechanism: i. Stability and energy level. ii. Equilibrium between ester and amide. iii. Effect of temperature on equilibrium costant. iv. Activation barrier. v. Effect of catalyst in carbonyl subs. Reaction.	10	5	
III. Determining reaction mechanism. i. The cannizzaro reaction ii. The Hammett relationship. iii. Other kinetic evidence iv. The detection of intermediate.	8	4	

4– Teaching and Learning Methods

4.1- Lectures using data show and board
4.2 - Problem classes and group tutorial
4.3 – Home works, Reports and discussion groups

5- Student Assessment Methods

5.1 written examination to assess the understanding

Assessment Schedule

Assessment 1 short exam (class activities)	Every two weeks
Assessment 2 mid-term (written)	Week 8
Assessment 3 final-term (written)	Week 13

Weighting of Assessments

Mid-Term Examination	20%
Final-term Examination	60%
Semester Work	20%
Total	100%

6- List of References

-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 I11975.
- Advanced organic chemistry, Clayden J., et al. Organic chemistry (no toc) (Oxford, 2000)(ISBN 0198503466)(1485s)

7- Facilities Required for Teaching and Learning

- Data show, screen, and laptop computer.
- White board and colored pens

Course Coordinator: Prof. Abdel Aleem Hassan Abdel Aleem.

Head of Department: Prof. Ahmed Abdel-Mageed

Date: 1 /12 /2012