

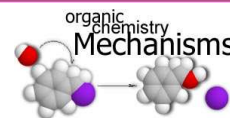
## CHEM 344

# ORGANIC REACTION MECHANISM

FOR CHEMISTRY' STUDENTS, COLLEGE OF SCIENCE

PRE-REQUISITES COURSE; CHEM 241

CREDIT HOURS; 2 (2+0+0)



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## TOPICS TO BE COVERED

- **Identification of different types of organic reactions** (Lectures; 2 h)
- **Physical method for identification of reactions mechanism.** (Lectures; 2 h)
- **Nucleophilic substitution reactions ( $S_N^1$  &  $S_N^2$ )** (Lectures; 3 h)
- **1<sup>st</sup> Midterm Exam** (Lectures; 1 h)
- **Elimination reactions** (Lectures; 3 h)
- **Solving problems** (Lectures; 2 h)
- **Addition to carbon-carbon double bond** (Lectures; 3 h)
- **Addition to carbonyl group.** (Lectures; 3 h)
- **2<sup>nd</sup> Midterm Exam** (Lectures; 1 h)
- **Aromatic substitution reactions.** (Lectures; 5 h)
- **Solving problems.** (Lectures; 2 h)

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## REFERENCES

- 1) *Reaction mechanisms of organic chemistry, 9th Edition, 2001.*
- 2) *Organic reaction mechanism, 4th Edition by V.K. Ahluwalia et al., 2016.*
- 3) *Guide Book to mechanism in organic chemistry by Peter Sykes.*
- 4) *Organic reaction mechanism, Salem Alshowiman et al. (Arabic Edition).*

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## SCHEDULE OF ASSESSMENT TASKS DURING THE SEMESTER

Assessment task	Week Due	Percentage of Total Assessment Score
1. Home work	All weeks	10 %
2. Quizzes	4,8	10 %
3. 1 <sup>st</sup> Midterm exam	5	20 %
4. 2 <sup>nd</sup> Midterm exam	9	20 %
<b>5. Final exam</b>	<b>13</b>	<b>40 %</b>

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## COURSE OBJECTIVES

Upon successful completion of this course, the student will be able to:

- Recall the methods used for investigation of reactions mechanism, energy considerations and stereochemical considerations.
- Realize the use of isotopes to understand the reaction.
- Recognize reaction intermediates, symmetry controlled reactions and kinetics.
- Use the applications of reactions (electrophilic, nucleophilic, elimination and addition).
- Recognize molecular rearrangements, structure-reactivity correlations and medium effect.

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## COURSE LEARNING OUTCOMES

### 1. Knowledge

- 1.1 To know the reaction mechanisms, kinetic considerations and stereochemistry.
- 1.2 To describe reaction intermediate, medium effect and controlled reactions.
- 1.3 To recognize and characterize the types of reactions mechanism and illustrate the principles of molecular rearrangements and structure-reactivity.
- 1.4 To predict the behavior of a specific reacting group toward a specific reagent and to the effect of medium condition

### 2. Skills

- 2.1 To apply the reaction mechanisms, stereochemistry and kinetics in identification of organic reactions.
- 2.2 To discuss the principles of rearrangements, structure-reactivity correlations and the main differences in organic reactions mechanism
- 2.3 To present scientific data both orally and written in scholarly manner.
- 2.4 To compare and distinguish reactivity based on the physical and chemical properties of the molecular structure
- 2.5 To rationally address problems in synthetic organic chemistry such as the structure, reactivity, choice of reagents and multi-step strategies for the synthesis of complex molecules

### 3. Competence

- 3.1 To develop the ability to effectively work individual and/or in teams and communicate the scientific information in written and oral formats.
- 3.2 To exchange ideas, principles and information by oral, written and presentation manner.

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