

# CHEM 241

# Organic Chemistry II

PRE-REQUISITES COURSE; CHEM 240  
CREDIT HOURS; 2 (2+0)

Syllabus

# Topics to be Covered

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## Organic halides

Types – Physical properties - Preparation and reactions (nucleophilic substitution reactions  $S_N^1$  and  $S_N^2$  - elimination reactions  $E_1$  and  $E_2$ ).

[Redacted]

[Redacted]

## Alcohols & Phenols

Nomenclature IUPAC – properties - synthesis and reactions of alcohols and phenols, their applications.

[Redacted]

[Redacted]

## Ethers and Epoxides

Nomenclature, properties, synthesis and Reactions.

[Redacted]

# Topics to be Covered

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## Aldehydes and Ketones

Nomenclature, properties, synthesis and Reactions, nucleophilic addition reaction and their reactivity's and applications.

[Redacted]

[Redacted]

## Carboxylic acids and their derivatives

Nomenclature, properties and acidities, synthesis and reactions and their applications.

[Redacted]

[Redacted]

## Amino compounds

Nomenclature, properties-basicity, synthesis and Reactions and applications in organic synthesis via diazonium salts derivatives.

[Redacted]

[Redacted]

# References

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- *Organic Chemistry, Francis A. Carey, 6th ed., McGraw-Hill Company 2007.*
- *Fundamental of Organic Chemistry, T. W. Graham Solomons and Craig Fryhle, 7th ed. John Wiley&Son, New York (latest).*
- *Fundamental of Organic Chemistry, Pro. Hassan Al-Hazimi and Mohamed Al-Hassan , Dar Alkharigy 4th 1421H (Arabic Edition)*

# COURSE OBJECTIVES

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

- **Recognize** the bases of the nomenclature, preparation and chemical behavior of the related functional groups: *organic halides, alcohols, phenols, ethers, epoxides, aldehydes, ketones, carboxylic acids* and *their derivatives* in addition to *amines*.
- **Describe** the mechanisms of reactions, in particular *nucleophilic, electrophilic substitution, elimination reaction* and *nucleophilic addition*.
- **Outline** the Scheme of the reaction including multi step reactions
- **Estimate** the *reactivity of organic compounds* towards electrophilic, nucleophilic substitutions and addition reactions.

# Course Learning Outcomes

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## 1. Knowledge

- 1.1 To name the different functional groups and organic compounds correctly and the types of alkyl halides.
- 1.2 To recognize the difference between  $S_N^1$  &  $S_N^2$ .
- 1.3 To describe the nucleophilic substitution reaction.
- 1.4 To describe the physical and chemical properties of organic compounds.
- 1.5 To memorize the differences substitution and elimination reaction.
- 1.6 To list the difference between electrophilic and nucleophilic reactions.
- 1.7 To outline a scheme including multi step reaction.

# Course Learning Outcomes

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## 2.0 Skills

- 2.1 To estimate the reactivity of organic compounds towards electrophilic and nucleophilic substitution reactions.
- 2.2 To differentiate between substitution and elimination reactions.
- 2.3 To explain the effect of leaving group on reactivity toward substitution reaction.
- 2.4 To compare between  $S_N^1$  &  $S_N^2$  and between E1 & E2.
- 2.5 To summarize the major requirement for substitution or elimination reaction

## 3.0 Competence

- 3.1 Choose the best synthetic route for a specific organic compound.
- 3.2 Illustrate the mechanisms of nucleophilic substitution and elimination reactions.
- 3.3 Justify the reactivity of carbonyl group.
- 3.4 Develop the ability to effectively communicate scientific information in written and oral formats.
- 3.5 Show professionalism, including the ability to work in teams and apply basic ethical principles.