University of Kurdistan
Faculty OF Science
Department of Chemistry

Advanced Organic Synthesis

Course Textbook

1: Advanced Organic Chemistry, Advanced Organic Chemistry 5th Ed Part B by Francis A. Carey; Richard J. Sundberg
http://www.library.rochester.edu/ezproxy_libguides.php?dbredirect=http://link.springer.com/book/10.1007%2F978-0-387-71481-3

2: **Designing Organic Synthesis, Warren**
https://www.amazon.com/Designing-Organic-Syntheses-Programmed-Introduction/dp/0471996122

3: **March's Advanced Organic Chemistry** 7th Ed by Michael B. Smith; Jerry March
http://site.ebrary.com/lib/rochester/detail.action?docID=10674800

About the Course

The course covers several total syntheses with the focus mainly the methods for functional group interconversion, selectivity and reactivity of reagents and functional groups.

Learning outcomes

On completion of the course, the students are expected have an in-depth knowledge in synthetic organic chemistry and be able to describe a variety of modern synthesis methods for transformation of functional groups as well as formation of new carbon-carbon and carbon-heteroatom bonds and propose a synthesis path with regard to access of appropriate start materials.

Course Contents	
1 st Week	**Chapter 1** Generation of Carbaniones
2 st Week	Regioselectivity and Stereoselectivity in Enolate Formation
3 st Week	Alkylation of Enolates
4 st Week	Alkylation of Aldehydes, Esters, Amids and Nitriles
5 st Week	Alkylation of Carbon Nucleophiles by Conjugate Addition
6 st Week	**Chapter 2** Aldol Addition and Condensation Reactions
7 st Week	Addition Reactions of Imines and Iminium Ions
8 st Week	Midterm Exam
9 st Week	Acylation of Carbanions
10 st Week	The Wittig and Related Reactions
11 st Week	Reactions of Carbonyl Compounds with Silylcarbanions / Sulphor Yielids and Related Nucleophiles / Nucleophilic Addition-Cyclization
12 st Week	**Chapter 3** Conversion of Alcohols to Alkylating Agents

13 st Week	Introduction of Functional Groups by Nucleophilic Substitution at Saturated Carbon
14 st Week	Cleavage of Carbon-Oxygen Bonds in Ethers and Esters
15 st Week	Interconversion of Carboxylic Acid Derivatives
16 st Week	Installation and Removal of Protective Groups

Assessment

The examination is based on theoretical tests that are organized continuously during the course. Each student is assessed by two examiners (midterm and final exams).

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