



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

| Course Contents | |
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| 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 Yields and Related Nucleophiles / Nucleophilic Addition-Cyclization |
| 12 st Week | Chapter 3 Conversion of Alcohols to Alkylating Agents |

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| 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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