

Special Sections of Organic Chemistry

Course Workload		Assessment form (examination/ graded test/ ungraded test)
ECTS	Hours	
3	108	Exam

This course is an intensive, comprehensive introduction to the chemistry of carbon and its importance to biological molecules. Topics include current ideas of bonding and structure, major reaction mechanisms and pathways, a discussion of the analytical tools used to determine the structure and stereochemistry of organic compounds. The course also includes a laboratory workshop on the synthesis and study of the composition of organic compounds, their purification, separation and identification.

Course structure:

1. Classification and nomenclature of organic compounds

- 1.1. Provisions of the IUPAC nomenclature
- 1.2. Principles for constructing systematic names of difficult organic molecules

2. Chemical bonds and mutual influence of atoms in organic compounds, Molecular orbital theory

- 2.1. Localized chemical bond
- 2.2. Delocalized chemical bond
- 2.3. Mutual influence of atoms in a molecule and methods of its transmission
- 2.4. Chemical Effect
- 2.5. Structures of molecular orbital
- 2.6. Orbital control of chemical reactions
- 2.7. Transition state

3. Stereochemistry

- 3.1. Stereochemistry of carbon
- 3.2. Enantiomer
- 3.3. Diastereomer

3.4. Stereoselectivity

3.5. Asymmetric synthesis

4. Classification of reactions in organic compounds

4.1. Types of organic reactions and reagents

4.2. Ideas about the mechanism of reactions

5. Electrophilic reactions

5.1. Reactions with N-electrophiles

5.2. Reactions with S-electrophiles

5.3. Reactions with C-electrophiles

5.4. Specific electrophilic reactions

6. Nucleophilic reactions

6.1. Reactions with N-nucleophiles

6.2. Reactions with S-nucleophiles

6.3. Reactions with C-nucleophiles

6.4. Reactions with O-nucleophiles

6.5. Specific nucleophilic reactions

7. Free radical reactions

7.1. Reactions with carbon radicals

7.2. Reactions with heteroatomic radicals

8. Reactions of cyclization and recyclization

8.1. Ring-opening reactions

8.2. Cascade reaction

8.3. Domino reactions

8.4. One-Pot methods
