

Level: bachelor			
Course title: Organic chemistry			
Status: obligatory			
ECTS: 9			
Requirements: none			
Learning objectives To provide the students with core theoretical and practical knowledge of Organic Chemistry and the ability to apply it to further studies in Chemistry or multidisciplinary areas involving Chemistry or employment in Chemistry based industry. The ability to reason logically and creatively. The ability to conduct an experiment precisely and safely. The ability to interpret experimental information and deduce appropriate conclusions.			
Learning outcomes After completing the course, the student will be able to demonstrate basic knowledge of Organic Chemistry. The characteristic reactions of functional groups, the structural, stereochemical and reactivity features of main groups of organic compounds.			
Syllabus <i>Theoretical instruction</i> Introduction to organic chemistry. Structure and bonding. Organic acids and bases. Structure of Methane, Ethane and Acetylene. The nature of organic reactions. Functional groups. Alkanes and alkyl groups. Isomers. Naming alkanes. Conformations of ethane. Drawing chemical structures. Cycloalkanes. Natural gas and Petroleum. Alkenes. Naming and electronic structure of alkenes. Cis-trans isomers of alkenes. The <i>E,Z</i> designation. Kinds of organic reactions. The mechanisms of organic reactions: Addition of HCl to ethylene. Addition of HX to alkenes. Markovnikov's rule. Reactions of alkenes. Alkynes. Reactions of alkynes. Aromatic compounds. Structure and reactions of benzene. Polycyclic aromatic hydrocarbons. Stereochemistry and the tetrahedral carbon. Alkyl halides. Nucleophilic substitution reactions. The S _N 1 and S _N 2 reactions. Eliminations. The E1 and E2 reactions. Alcohols, ethers, and phenols. Synthesis and reactions. Cyclic ethers. Thiols and sulfides. Aldehydes and ketones. Synthesis and reactions of aldehydes and ketones. Grignard reagents. Carboxylic acids and derivatives. Fats and oils. Soaps. Nylons and polyesters. Carbonyl alpha-substitution reactions and condensation reactions. Condensations of esters. Amines. Structure and properties of amines. Synthesis and reactions of amines. Heterocyclic amines. Carbohydrates. Fischer projections and cyclic structures. Reactions of monosaccharide. Glycosides. Disaccharides. Polysaccharides. Amino acids, peptides, and proteins. Structure and properties. Basic organic polymers. <i>Practical instruction</i> Detailed written instructions will be given for carrying out basic laboratory operations (melting point determination, distillations, pre-crystallizations, extractions) and reactions on organic compounds.			
Weekly teaching load			Other:
Lectures: 3	Exercises: 3	Other forms of teaching: 2	