

Study program : PHARMACY
Type and level of studies: Integrated academic studies
Course unit: Organic Chemistry
Teacher in charge : dr Gordana P. Radić, associate professor
Language of instruction : ENGLISH
ECTS: 8
Prerequisites:
Semester: SECOND (SUMMER) SEMESTER
Course unit objective: Acquiring knowledge and skills in organic chemistry.
<p>Learning outcomes of Course unit:</p> <ul style="list-style-type: none"> • Knowledge about fundamentals of Organic chemistry and its significance for Pharmaceutical chemistry; • Structure of atom; Bonding in organic compounds; Chemistry of the functional groups; Hydrocarbons; Alkyl- and aryl- halides; Alcohols and ethers; Aldehydes and ketones, reactions of the carbonyl group; Carboxylic acids and derivatives; α, β-unsaturated carbonyl compounds; Heterocyclic compounds; Organic nitrogen compounds; Carbohydrates; Amino acids; Proteins and nucleic acids; Lipides and oils. • Mechanism of reactions in Organic chemistry; • Protocol of the organic synthesis and their significance in the biological system and medicinal chemistry. • On this course students will learn new skills and improve their knowledge about practical laboratory work.
<p>Course unit contents</p> <p><i>Theoretical classes</i> <i>Fundamentals of Organic chemistry and its significance for Pharmaceutical chemistry; Structure of atom; Bonding in organic compounds; Chemistry of the functional groups; Hydrocarbons; Alkyl- and aryl- halides; Alcohols and ethers; Aldehydes and ketones, reactions of the carbonyl group; Carboxylic acids and derivatives; α, β-unsaturated carbonyl compounds; Heterocyclic compounds; Organic nitrogen compounds; Carbohydrates; Amino acids; Proteins and nucleic acids; Lipides and oils. Mechanism of reactions in Organic chemistry; Mechanism of the organic synthesis and their significance in the biological system and medicinal chemistry.</i></p> <p><i>Practical classes</i> <i>Laboratory glassware and equipment; Distillation of organic compounds; purification and drying of the solvent; Qualitatively detection of different organic compounds; Mechanism of free-radical substitution of alkane; Reactions of addition; Synthesis and characterization of acetylene; Mechanism of electrophilic aromatic substitution; Preparation of organic alkyl- and aryl- halides; Differences between S_N1 u S_N2 nucleophilic substitution mechanisms; Differences between $E1$, $E2$ u $E1cB$ elimination mechanisms; Preparation of alcohols, Chemical properties of alcohols; Synthesis of aromatic ethers; Evidence reactions for aldehydes and ketones; Preparation of carboxylic acids; Preparation of esters; Using carbanion in the reactions of condensation; Organometallic compounds; Evidence reactions for amines; Reactions of amines and nitric acid; Proving mechanisms of some reactions; Planning of organic synthesis; Examples of nucleophilic and electrophilic reagents; Chromatography; Using of cyclization reactions in the preparation of natural products and physiologically active compounds.</i></p>
<p>Literature</p> <ul style="list-style-type: none"> • Dewick PM. Essentials of Organic Chemistry: For Students of Pharmacy, Medicinal Chemistry and Biological Chemistry. Nottingham: Wiley; 2006. • Smith MB, March J. Marc's advanced organic chemistry reactions, mechanisms, and structure. Sixth edition. New Jersey: Wiley; 2007.

Number of active teaching hours				Other classes
Lectures: 60	Practice: 30	Other forms of classes:	Independent work: 150	
Teaching methods: Lectures, practice in a clinic, clinical problems solving				
Examination methods (maximum 100 points)				
Exam prerequisites	No. of points:	Final exam	No. of points:	
Student's activity during lectures	30	oral examination	70	
practical classes/tests		written examination		
Seminars/homework				
Project				
Other				

Grading system		
Grade	No. of points	Description
10	91-100	Excellent
9	81-91	Exceptionally good
8	71-81	Very good
7	61-71	Good
6	51-61	Passing
5	< 51	Failing

(Table 5.2) Course unit description