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| **Study program** Chemistry | | | | |
| **Course title** Organic chemistry 2 | | | | |
| **Name of lecturer/lecturers** Niko S. Radulović | | | | |
| **Type of course** Obligatory | | | | |
| **Number of ECTS allocated** 8 | | | | |
| **Course objectives**  Getting to know the basic concepts of the structure and reactions of selected classes of organic compounds, nomenclature of these compounds, dependence of physical and chemical properties and structure of molecules,  possibilities of synthesis of organic molecules and their application. Correlation of structure and reactivity of organic molecules and its application | | | | |
| **Course outcomes**  After completing the course, the student should: know the connection between physical and chemical properties  of organic compounds and their structure and stereochemistry, to name organic compounds according to the IUPAC nomenclature and adopt the basic principles of naming and stereochemistry of natural and more complex synthetic organic compounds, understands the transformations of functional groups and mechanisms of organic reactions of mono- and polyfunctional compounds, be able to apply them of organic transformations in biological systems. | | | | |
| **SYLLABUS**  *Lectures*  Structure, nomenclature, production, physical properties and reactions: alkyl- and aryl-halides, organometallic compounds, alcohols, ethers, organo-sulfur compounds, phenols. Nucleophilic substitution. Amines and their derivatives: synthesis and properties. Correlation of structure and basicity of amines. Nitro compounds: structure and properties. Aromatic nitro compounds, explosives. Aldehydes and ketones: structure, properties and synthesis. Nucleophilic addition to the carbonyl group. Enolates and enols. Ketoenolic tautomery. Aldol reaction. Properties of α,β-unsaturated aldehydes and ketones and conjugate addition reactions. Carboxylic acids: structure, properties and synthesis. Correlation of structure and acidity. Reactions of carboxylic acids. Conversion to carboxylic acids derivatives. Nucleophilic carbonyl substitution. α-halogen substituted acids and their reactions. Derivatives of carboxylic acids: acyl halides, anhydrides, esters, amides and nitriles. Structure, properties, synthesis and reactivity in the nucleophilic carbonyl substitutions reaction. Synthesis and reactions of β-dicarbonyl compounds. Enolates and Claisen condensation. Malone ester and acetic ester synthesis. Introduction to synthesis strategy.  *Practical work*  Theoretical exercises that follow lectures, and illustrate the most important organic reactions. | | | | |
| **References**  K.P.C. Volhard, N.E. Šore, Organska hemija, 4. izdanje, Data Status, Beograd, 2004.  S.H. Pajn, Organska kemija, Školska knjiga, Zagreb, 1994.  T.W. Graham Solomons, C.B. Fryhle, Organic Chemistry, 8th ed., John Wiley Inc, New York, 2004.  Ž. Čeković, Eksperimentalna organska hemija, Hemijski fakultet, Beograd, 1995 | | | | |
| **Active teaching classes** | **Lectures** 60 | | **Laboratory work** 15 | |
| **Teaching mode** lectures, theoretical exercises, homework, seminar | | | | |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** | | | | |
| **Pre exam duties** | **Points** | **Final exam** | | **Points** |
| Activity during lectures | 5 | Written examination | | 20 |
| Practical teaching | 15 | Oral examination | | 20 |
| Teaching colloquia | 30 |  | |  |
| Homework | 5 |  | |  |
| Seminar | 5 |  | |  |