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| **Study program** Undergraduate Studies | | | | |
| **Course title** Chemistry of natural products (H123C) | | | | |
| **Name of lecturer/lecturers**  Danijela Kostić | | | | |
| **Type of course** Obligatory | | | | |
| **Number of ECTS allocated 7** | | | | |
| **Course objectives** Acquiring basic academic knowledge in the field of chemical structure, reactivity, transformation natural products and acquiring the skills of their isolation and purification, as well as identification. The basic biological roles of natural products. | | | | |
| **Course outcomes**.  Ability to adequately understand the structure, importance and role of representatives of natural resources  aspects of isolation, structural characteristics, physico-chemical properties and biological effects. | | | | |
| **SYLLABUS**  *Lectures*  Amino acids, peptides and proteins  Classification and nomenclature of amino acids. Stereochemistry of amino acids. Acid-base characteristics of amino acids. Chemical reactions and synthesis. Peptides. Peptide bond characteristics. Peptide synthesis strategy Biologically significant peptides.  Carbohydrates  Classification of carbohydrates. Monosaccharides, structure, configuration and conformation. Derivatives of monosaccharides. Chemical reactions of monosaccharides. Disaccharides. Polysaccharides. Heteropolysaccharides. Glycoproteins and glycolipids.  Lipids  Lipids-general properties, classification. Fatty acids - physical properties and chemical reactions. Fats and oils –chemical structure, division, physical properties and chemical reactions. Characterization of fats and oils. Lipid oxidation, natural and artificial antioxidants. Waxes. Phospholipids, lipoproteins and glycolipids. Steroid classification, nomenclature. Sterols. Bile acids and steroid hormones.  Alkaloids  Alkaloids-properties and physiological action. Isolation and determination of alkaloid structure. Classification of alkaloids. Simple structure alkaloids. Alkaloids with pyrrolidine, piperidine, pyridine and imidazole ring. Alkaloids with condensed pyrrolidine and piperidine rings. Alkaloids with phenanthrene ring. Purine alkaloids  Natural phenolic compounds  Phenolic compounds-physical and chemical properties. Isolation of phenolic compounds. Classification of phenolic compounds. Biological function. Simple phenolic compounds. Quinones, coumarins and their derivatives. Lignans and lignins. Chromones and their derivatives. Flavonoids.  *Laboratory work*  1. Amino acids-isolation and purification, identification 2. Isolation and purification of protein. Chemical reactions and denaturation of proteins 3. Isolation, purification and reactions of carbohydrates 4. Isolation, purification and chemical reactions of lipids. 5. Isolation, purification of alkaloids and chemical reactions 6. Isolation and purification, chemical reactions of flavonoids | | | | |
| **References**  1. Stevan Lajišić, Hemija prirodnih proizvoda, Naučna knjiga, Beograd,  2. V.Živanović, D.Kostić, Osnovi biohemije, PMF, Niš, 2008  3. P.Vollhardt, N.Schore, Organska hemija, Hajdigraf, Beograd, 1996  4. Stevan Lajišić, Praktikum iz hemije prirodnih proizvoda, Naučna knjiga, Beograd,1980 | | | | |
| **Active teaching classes** | **Lectures 45** | | **Laboratory work 60** | |
| **Teaching mode** theoretical lectures, Power point presentations, experimental exercises | | | | |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** | | | | |
| **Pre exam duties** | **Points** | **Final exam** | | **Points** |
| Activity during lectures | 10 | Written examination | | / |
| Practical teaching | 20 | Oral examination | | 30 |
| Colloquiums | 40 |  | |  |