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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Science and MathematicsDepartment of Chemistry |
| **GENERAL INFORMATION** |
| Study program  | **Chemistry** |
| Study Module (if applicable) | Research and development |
| Course title | Organic syntheses |
| Level of study | ☐ Bachelor ⊗ Master’s ☐ Doctoral |
| Type of course | ⊗ Obligatory ☐ Elective |
| Semester  | ⊗ Autumn ☐Spring |
| Year of study  | first |
| Number of ECTS allocated | 8 |
| Name of lecturer/lecturers | Niko Radulović |
| Teaching mode |  ⊗ Lectures ☐Group tutorials ☐ Individual tutorials ⊗ Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| The course introduces the student to the disconnection approach to organic synthesis, i.e. retrosynthetic analysis. With this approach a chemist will start with the structure of their target molecule and progressively cut bonds to create simpler molecule; reversing this process gives a synthetic route to the target molecule from simpler starting materials. Lectures on the synthesis of given types of molecules alternate with strategy lectures in which the methods just learnt are placed in a wider context. The synthesis lectures cover many ways of making each type of molecule starting with simple aromatic and aliphatic compounds with one functional group and progressing to molecules with many functional groups. The strategy lectures cover questions of selectivity, protection, stereochemistry, and develop more advanced thinking via reagents specifically designed for difficult problems. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| The course is aimed at teaching the skills needed to design total synthesis of organic molecules. Both the knowledge-base of reactions which can be used, and the strategy of their employment will be covered. The course typically follows the organization indicated below. Introduction: Planning Organic Syntheses; Synthons and Reagents: Aromatic Compounds; Strategy I: The Order of Events; One-Group C-X Disconnections; Chemoselectivity; Two-Group C-X Disconnections; Strategy III; Amine Synthesis; Protecting Groups; One Group C-C Disconnections I: Alcohols; General Strategy A: Choosing Disconnections; Stereoselectivity A; One Group C-C Disconnections II: Carbonyl Compounds; Regioselectivity; Alkene Synthesis; Strategy VII: Use of Acetylenes; Diels-Alder; Strategy VIII: Carbonyl Condensations; 1,3-diCO Compounds; Control in C=O Condensations; 1,5-diCO Compounds; Nitro Groups; 1,2-diCO Compounds; Radicals; 1,4-diCO Compounds; Reconnection; 1,6-diCO Compounds; Strategy of C=O Disconnections; Saturated Heterocycles; Cyclopropanes; Rearrangements; Four-Membered Rings; Ketenes; Five-Membered Rings; Pericyclic Reactions; Six-Membered Rings; Strategy of Ring Synthesis; Stereoselectivity B; Aromatic Heterocycles; Advanced Strategy. |
| **LANGUAGE OF INSTRUCTION** |
| ⊗ Serbian (complete course) ☐ English (complete course) ☐ Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)☐Serbian with English mentoring ☐Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** | **10** | **Written examination** | **40** |
| **Practical teaching** | **10** | **Oral examination** | **10** |
| **Teaching colloquia** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |