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| **Study program:** Doctoral academic studies **-** Chemistry | | |
| **Course title:** Physical Organic Chemistry (H303C) | | |
| **Name of lecturer/lecturers:** Marija S. Genčić | | |
| **Type of course:** elective | | |
| **Number of ECTS allocated:** 10 | | |
| **Course objectives**  The aim of the course is to familiarize the PhD students with advanced concepts of physical organic chemistry. | | |
| **Course outcomes**  Upon successful completion of this course, the student will be able to:  - discuss the relationships between structures - stability - reactivity - physical properties,  - broken down any organic reaction into elementary steps,  - propose experiments that test his mechanistic assumptions and discusses their results. | | |
| **SYLLABUS**  *Lectures*  Structure and models of chemical bonding. Strain and stability. Solvents and non-covalent bonding interactions. Molecular recognition and supramolecular chemistry. Acid-base chemistry. Stereochemistry. Energy surfaces and kinetic analysis. Experiments related to thermodynamics and kinetics. Catalysis. Mechanisms of organic reactions: reactions involving addition and/or elimination, substitution reactions on aliphatic centers and thermal isomerizations/displacements. Mechanisms of reactions involving organo-transition-metal compounds and catalysis. Organic polymers and material chemistry. Advanced concepts in electronic structure theory. Thermal pericyclic reactions. Photochemistry. Electronic organic materials. | | |
| **References**  1. E. V. Anslyn, D. A. Dougherty, Modern Physical Organic Chemistry, University Science Books, Sausalito, California, 2005.  2. P. Vogel, K. N. Houk, Organic Chemistry: Theory, Reactivity and Mechanisms in Modern Synthesis (1st Edition), Wiley-VCH, Weinheim, Germany, 2019. | | |
| **Active teaching classes** | **Lectures:** 105 | **Laboratory work:** / |
| **Teaching mode:** lectures, seminar, consultations | | |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** | | |
| activity during the lecture - 10 points; seminar - 20 points; homework - 20 points; written exam - 50 points | | |