(Table 5.2) Course unit description

<table>
<tr><td colspan="5">Study program: Chemistry</td></tr>
<tr><td colspan="5">Type and level of studies: Doctoral studies</td></tr>
<tr><td colspan="5">Course unit: Kinetics and mechanisms of substitution reactions</td></tr>
<tr><td colspan="5">Teacher in charge: Prof. Dr Biljana Petrovic</td></tr>
<tr><td colspan="5">Language of instruction: English</td></tr>
<tr><td colspan="5">ECTS: 10</td></tr>
<tr><td colspan="5">Prerequisites: No prerequisites</td></tr>
<tr><td colspan="5">Semester: Winter</td></tr>
<tr><td colspan="5">Course unit objective
The objective of the course is that students learn and understand the material upgrading their previously acquired knowledge, which will be used in further scientific research work.</td></tr>
<tr><td colspan="5">Learning outcomes of Course unit
Through this subject student will be theoretically qualified for scientific research in this field and will acquire experimental skills to independently examine the kinetics and mechanisms of different substitution reactions. The student is trained to use various experimental method and computer processing of measurement results.</td></tr>
<tr><td colspan="5">Course unit contents
Theoretical classes:
Chemical kinetics. Kinetics and equilibria. Order of the reaction. The influence of different physical and chemical parameters on the rate of chemical reaction (temperature, pressure, ionic strength, solvent nature, pH, etc.). Experimental methods in chemical kineics for fast and slow chemical reactions. Mathematical processing of experimental data. Application of various computer programs for the processing of kinetic data. Relation between activation parameters and type of mechanism. The transition state theory. Reactions of substitution of octahedral complexes. Reaction of substitution of square-planar complexes. Reactions of substitution of tetrahedral complexes. Kinetics of the substitution reactions of transition metal complexes with biologically significant ligands. Redox reactions. Complementary and non-complementary reactions. Multiple transmission of the electron. Reductive elimination and oxidative addition. Solvated electron.
Practical teaching:
Experimental work that include the study of mechanism of different substitution and redox reactions of transition metal complexes by UV-VIS, NMR, HPLC and stop[ed-flow methods.</td></tr>
<tr><td colspan="5">Literature
1. M. L. Tobe and J. Burgess, Inorganic Reaction Mechanisms, Addison Wesley Longman Inc., Esseh, 1999.
2. K. A. Connors, Chemical Kinetics, The Study of Reaction Rates in Solution, VCH, Weinheim, 1990</td></tr>
<tr><td colspan="4">Number of active teaching hours</td><td rowspan="2">Other classes:</td></tr>
<tr><td>Lectures:
5</td><td>Practice:
/</td><td>Other forms of classes:
/</td><td>Independent work:
/</td></tr>
<tr><td colspan="5">Teaching methods
Lectures, seminars, taska</td></tr>
<tr><td colspan="5">Examination methods (maximum 100 points)</td></tr>
<tr><td>Exam prerequisites</td><td>No. of points</td><td>Final exam</td><td colspan="2">No. of points</td></tr>
<tr><td>Practical classes</td><td></td><td>Written examination</td><td colspan="2">40</td></tr>
<tr><td>Tests</td><td></td><td>Oral examination</td><td colspan="2">20</td></tr>
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Homework		Other	
Seminars	20		
Project	20		

Grading system		
Grade	**No. of points**	**Description**
10	>= 91	Excellent
9	81-90	Exceptionally good
8	71-80	Very good
7	61-70	Good
6	51-60	Passing
5	<=50	Failing