(Table 5.2) Course unit description

Study program: Chemistry				
Type and level of studies: Doctoral academic studies				
Course unit: Coordination chemistry				
Teacher in charge: Prof. Dr. Miloš I. Djuran				
Language of instruction: *English*				
ECTS: 15				
Prerequisites: Student of doctoral academic studies				
Semester: *Winter Semester*				
Course unit objective Introduction to the principles and descriptive coordination chemistry, as one of the most important areas of modern inorganic chemistry.				
Learning outcomes of Course unit This course provides opportunity for students to gain knowledge of coordination chemistry - nomenclature, stereochemistry, synthetic methods, interpretation of spectra, magnetism, and the importance and application of coordination compounds.				
Course unit contents *Theoretical classes* Introduction and historical development of coordination compounds. Nomenclature of coordination compounds. The chemical bond in coordination compounds. Ligand field theory. Molecular orbital theory. Hard and soft Lewis acids and bases. Ligands. Classification and types of ligands. Chelate effect. Amino acids and peptides as ligands. Geometry of the coordination compounds. Substitution reaction in square planar and octahedral complexes. The concept of *trans*-effect. Symmetry aspects of coordination compounds. Isomerism of coordination compounds. Separation of isomeric octahedral complexes by ion exchange chromatography. Optical activity of octahedral complexes. Racemates and enantiomers. The absolute configuration of octahedral complexes. Methods for determination of absolute configurations. Circular dichroism. Conformation of chelate rings (five- and six-membered rings). The application of UV-vis, IR and NMR spectroscopy for determination of the complex structure. X-ray analysis as a method for determination of the complex structure. The magnetic properties of the complexes. Aspects of bioinorganic chemistry. Essential micro- and macro-elements and their importance in the living systems. Application of metal complexes in medicine. Stereochemistry of the chromium, manganese, iron, cobalt and nickel complexes. Stereochemistry of the ruthenium, rhodium, palladium, osmium, iridium, and platinum complexes. Stereochemistry of copper and zinc complexes.				
Literature 1. F. A. Cotton, G. Wilkinson, Advanced Inorganic Chemistry, Interscience Publishers, John Wiley & Sons, New York. 2. C. A. Housecroft, A. G. Sharpe, Inorganic Chemistry, fourth edition, Pearson, Harlow, England, 2012. 3. G. L. Miessler, P. J. Fisher, D. A. Tarr, Inorganic Chemistry, fifth edition, Pearson, USA, 2014.				
Number of active teaching hours				**Other classes**
Lectures: 6	Practice:	Other forms of classes:	Independent work:	
Teaching methods Lectures and seminars.				

Examination methods (maximum 100 points)			
Exam prerequisites	**No. of points:**	**Final exam**	**No. of points:**
Student's activity during lectures	**10**	oral examination	*60*
practical classes/tests		written examination	
Seminars/homework	**30**	……	
Project			
Other			

Grading system		
Grade	**No. of points:**	**Description**
10	**91-100**	Excellent

9	**81-90**	Exceptionally good
8	**71-80**	Very good
7	**61-70**	Good
6	**51-60**	Passing
5	**0-50**	Failing