Faculty of Metalurgy and Technology / CHEMICAL TECHNOLOGY / COORDINATION COMPOUNDS (SELECTED CHAPTERS)

Course:	COORDINATION COMPOUNDS (SELECTED CHAPTERS)			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
12282	Mandatory	1	5	2+2+0
Programs	CHEMICAL TECHNOLOGY			
Prerequisites	No conditionality			
Aims	Study of the chemistry of complex compounds from the point of view of structure, nature of chemical bond, spectroscopic and magnetic behavior. Special review of selected ligands and central atoms.			
Learning outcomes	1. Recommend possible ways of coordination of complex compounds 2. Compare the observed changes that occur during the coordination of the ligand to the central atom. 3. To review the appropriateness of the methods used to solve the structures of complex compounds 4. Analyze the synthesized complexes by analytical methods, especially FTIR, UVVis and XRD methods. 5. Correctly and independently synthesize the complexes while observing all prescribed precautions			
Lecturer / Teaching assistant	Docent Milica Kosović Perutović			
Methodology	Lectures, exercises, seminar papers, homework.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction to coordination chemistry.			
I week exercises	/			
II week lectures	Hard and soft acids and bases. Classification and types of ligands.			
II week exercises	Application of instrumental analytical methods in determining the structure of complex compounds.			
III week lectures	Molecular orbital theory coordination compounds.			
III week exercises	Analysis of UVVIs spectra of complex compounds.			
IV week lectures	Geometric structure of complexes and ligand field theory.			
IV week exercises	Analysis of FTIR spectra of complex compounds.			
V week lectures	The magnetism of complex compounds.			
V week exercises	Synthesis of a complex compound with monodentate ligands (Part I).			
VI week lectures	Isomerism in complex compounds.			
VI week exercises	Synthesis of a complex compound with monodentate ligands (Part II).			
VII week lectures	Complex compounds of Fe, Cu, Co, Ni i Zn.			
VII week exercises	Structure determination of the synthesized complex with monodentate ligands.			
VIII week lectures	Complex compounds of Ag and Au.			
VIII week exercises	Synthesis of pyrazole derivatives.			
IX week lectures	Complex compounds of Pt and Pd.			
IX week exercises	Synthesis of a complex compound with a newly synthesized pyrazole derivative as a ligand.			
X week lectures	Kinetics and Mechanism of Reactions of Transition Metal Complexes.			
X week exercises	UV-vis and FTIR spectra of the synthesized complex with a pyrazole derivative as a ligand.			
XI week lectures	Coordination chemistry of pyrazole derivatives.			
XI week exercises	Synthesis of dithiocarbamate derivatives.			
XII week lectures	Coordination chemistry of dithiocarbamate derivatives.			
XII week exercises	Synthesis of a complex compound of dithiocarbamato derivatives.			
XIII week lectures	Amino acids and peptides as ligands.			
XIII week exercises	Spectral analysis of complexes of dithiocarbamato derivatives.			
XIV week lectures	Significance and application of complex compounds.			

XIV week exercises	Colloquium.
XV week lectures	Preparation for the final exam.
XV week exercises	/
Student workload	Weekly: 5 credits x 40/30=6.67 hours In the semester 5x30=150 hours

Per week	**Per semester**
5 credits x 40/30=6 hours and 40 minuts 2 sat(a) theoretical classes 0 sat(a) practical classes 2 excercises **2 hour(s) i 40 minuts** of independent work, including consultations	Classes and final exam: **6 hour(s) i 40 minuts x 16 =106 hour(s) i 40 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **6 hour(s) i 40 minuts x 2 =13 hour(s) i 20 minuts** Total workload for the subject: **5 x 30=150 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **30 hour(s) i 0 minuts** Workload structure: **106 hour(s) i 40 minuts (cources), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)**
Student obligations	Students are obliged to complete all laboratory exercises provided by the program.
Consultations	An hour after each exercise or an appointment according to an earlier agreement with the students.
Literature	1. N. Milić, Neorganska kompleksna i klasterna jedinjenja, PMF Kragujevac, 1998 2. Robert H. Crabtree. The Organometallic Chemistry of the Transition Metals, Fourth Edition. John Wiley and Sons, Yale University, New Haven, Connecticut, 2005. 3. M. I. Đuran, Primena kompleksnih jedinjenja u medicini, PMF Kragujevac, 2000. 4. B. Petrović, R. Jelić i Ž. Bugarčić. Sinteza i karakterizacija kompleksnih jedinjenja, praktikum za vežbe. PMF Kragujevac, 2002 5. D. Grdenić, Molekule i kristali, Školska knjiga, Zagreb, 2005
Examination methods	Activity in lectures and exercises - 5 points Homework – (2x5) 10 points Seminar work - 15 points Colloquium – 20 points Final exam – 50 points
Special remarks	
Comment	

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points