

Study program : Chemistry			
Type and level of studies: Master in chemistry			
Course unit: Inorganic synthesis and methods for characterization			
Teacher in charge: Prof. Dr Biljana Petrovic			
Language of instruction: English			
ECTS: 6			
Prerequisites: None			
<i>(Winter Semester or Summer Semester): Summer semestar</i>			
Course unit objective			
The main goal of course is to acquire modern knowledge in the field of synthesis of various classes of inorganic compounds and methods of their purification and characterization as well as enabling students for independent synthesis and analysis of inorganic compounds.			
Learning outcomes of Course unit			
The outcomes of course is to train students for the preparation and characterization of pure, on a laboratory level, elements, alloys and different classes of simple and complex inorganic compounds.			
Course unit contents			
<i>Theoretical classes</i>			
Basic laboratory operations. Solvents. Polar protic solvents. Polar aprotic solvents. Non-polar solvents. Working in an inert atmosphere. Purification of gases. Methods for removing O ₂ from gases. Methods for removing water vapor from gases. Methods for removing CO ₂ from gases. Work under vacuum. Chromatography. Classification of chromatographic methods. Laminar (planar) chromatography. Column chromatography. Adsorption chromatography. Methods for separation and analysis of chromatograms. Ion exchange chromatography. Affinity chromatography. Paper chromatography. Thin-layer chromatography (TLC). Gas chromatography. High performance liquid chromatography (HPLC). Elemental analysis Melting point. Boiling point. Spectroscopic methods (structural). UV-Vis spectrophotometry. Electronic d-d transition. Spectral terms. IR spectroscopy. Mass spectroscopy. Electron Impact (EI) mass spectrometry. Chemical Ionization (CI) mass spectrometry. FAB mass spectrometry. Electrospray Mass Spectrometry (ESI-MS). NMR. EPR spectroscopy. Circular dichroism. X-ray structural analysis, Scherrer's formula. X-ray diffractometer.			
<i>Practical classes (Laboratory exercises)</i>			
Independent student work involving synthesis, purification and characterization of four different complex compounds using modern methods (UV-Vis, IR, NMR, EPR, HPLC).			
Literature			
1. W. L. Jolly, Synthesis and characterization of inorganic compounds, Prentice Hall International, Hearts 1970.			
Number of active teaching hours			
Lectures: 2	Practice: 2	Other forms of classes: /	Independent work: / Other classes /
Teaching methods			
Lectures, Laboratory practice, Seminars			
Examination methods (maximum 100 points)			
Exam prerequisites	No. of points:	Final exam	No. of points:
Student's activity during lectures	10	oral examination	<i>15</i>
practical classes/tests	20	written examination	<i>15</i>
Seminars/homework	10	
Other (kolokvia)	20		
Grading system			
Grade	No. of points	Description	
10	Excellent	
9	Exceptionally good	
8	Very good	

7	...	Good
6	...	Passing
5	...	Failing