UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	SINTEZNE METODE V ANORGANSKI KEMIJI
Course Title:	METHODS OF SYNTHESIS IN INORGANIC CHEMISTRY

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
VSŠP Kemijska tehnologija, 1. stopnja	/	2.	3.
PSP Chemical Technology, 1st Cycle	/	2nd	3rd

Vrsta predmeta / Course Type: izbirni strokovni / Elective Professional

Univerzitetna koda predmeta / University Course Code: KTSI2

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Work	Druge oblike študija	Samost. delo Individual Work	ECTS
/	15	60 LV	/	/	75	5

Nosilec predmeta / Lecturer: doc. dr. Andrej Pevec / Dr. Andrej Pevec, Assistant Professor

Jeziki / Languages:

Predavanja / Lectures:	**slovenski / Slovenian**
Vaje / Tutorial:	**slovenski / Slovenian**

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Študent oz. kandidat mora imeti predmet opredeljen kot študijsko obveznost.

Prerequisites:

The course has to be assigned to the student.

Vsebina:

Vsebina seminarjev in vaj: Študenti bodo pri predmetu sintetizirali anorganske snovi z različnimi zahtevnejšimi sinteznimi tehnikami in dobljene snovi preiskali.
Pripravili bodo nekatere kovinske acetilacetonate, fluoridooksovanadate(IV), sintetizirali kalikev tris(oksalato)ferat(III) trihidrat, heksaaminkobaltov(III) klorid in silikon. Spoznali se bodo tudi s pripravo TiO2 po sól-gel metodi. Z reakcijo v trdnem stanju bodo pripravili superprevodne spojine. Pri pripravi spojine bakrovega klorida z dimetoksietanom pa se bodo naučili dela z inertno atmosfero in vakuumom. Kot primer uporabe UV-Vis spektroskopije za določevanje kemijske kinetike bo namenjena vaja Hitrost reakcije med Cr(III) in EDTA. Spojine, ki jih

Content (Syllabus outline):

Seminars and exercises: The students synthesize inorganic compounds with various advanced synthetic techniques, and characterize the products. They prepare some metal acetylacetonates, fluoridooxovanadates(IV), potassium tris(oxalato)ferrate(III) trihydrate, hexamincobalt(III) chloride and silicone. They also learn about the preparation of TiO2 by sol - gel method. They prepare superconducting compounds by the reaction in the solid state. In the preparation of the complex copper chloride with dimethoxyethane they learn how to work with an inert atmosphere and a vacuum. The reaction between Cr(III) and EDTA is investigated by the use of UV - Vis spectroscopy

bodo študentje pripravljali bodo karakterizirali z razpoložljivimi metodami, kot so IR spektroskopija, UV-Vis spektroskopija, magnetne meritve, termična analiza, rentgenska praškovna analiza. Rezultate bodo zbrali in ovrednotili v poročilu. V projekte bomo kasneje zajeli nove snovi, ki jih uporablja pri tekočem raziskovalnem delu nosilec predmeta ali njegovi sodelavci. Pri seminarju bodo študenti dobili primerno teoretsko osnovo in navodila za vaje.	for the determination of the chemical kinetics. The compounds prepared by the students are characterized using the available methods, such as IR spectroscopy, UV - Vis spectroscopy, magnetic measurements, thermal analysis and X-ray powder analysis. The results are collected and evaluated in the report. The new compounds will be included in the project, especially those used by lecturer or his coworkers in the current research work. During the seminar, students get adequate theoretical basis and guidelines for practice.

Temeljna literatura in viri / Readings:

- S. Petriček, F. Perdih in A. Demšar, Vaje iz anorganske kemije, Založba FKKT UL, Ljubljana, 2012, strani 75 – 119.

Cilji in kompetence:	**Objectives and Competences:**
Cilj predmeta je študentom omogočiti poglobitev znanja metod sintez in preiskav anorganskih spojin kot nadgraditev predmeta Anorganska kemija II. Specifično, študenti pri projektno zasnovanemu predmetu spoznajo pristop k projektu od iskanja podatkov po bazah, preko laboratorijske sinteze in preiskav produktov do ovrednotenja in predstavitve rezultatov.	The aim of this course for students is to improve knowledge about synthetic methods and characterization of inorganic compounds to upgrade course Inorganic Chemistry II. In project-based approach of this course students learn more about search data bases, laboratory synthesis techniques, characterization of the products and evaluation and presentation of results.

Predvideni študijski rezultati:	**Intended Learning Outcomes:**
<u>Znanje in razumevanje</u> Predmet predstavlja poglobitev znanja predmeta Anorganska kemija II z zahtevnejšimi laboratorijskimi tehnikami in daje študentu celovit pogled na reševanje kemijskega problema.	<u>Knowledge and Comprehension</u> This course represents an advanced knowledge of the course Inorganic Chemistry II with advanced laboratory techniques and gives students a comprehensive view of solving chemical problems.
<u>Uporaba</u> Študent spozna zahtevnejše metode sinteze spojin in določitve njihovih lastnosti. Dobi občutek za samostojno organizacijo in izvedbo dela v laboratoriju. Rezultate svojega dela je sposoben predstaviti in razložiti.	<u>Application</u> Students learn advanced methods of synthesizing compounds and determining their properties. They get a sense of self-organizing and carrying out work in the laboratory. Results of their work are able to present and explain.
<u>Refleksija</u> S spoznavanjem zahtevnejšega eksperimentalnega dela študenti spoznajo, da imajo zahtevni teoretski principi svojo praktično uporabo.	<u>Analysis</u> By learning of advanced experimental work the students find that complex theoretical principles have their practical application.
<u>Prenosljive spretnosti</u> Laboratorijske veščine, izkušnje in prijemi pri	<u>Skill-transference Ability</u> Laboratory skills, experience and approaches to

načrtovanje sintez so pomembni pri drugih kemijskih predmetih in pri osebnemu strokovnemu razvoju.	design synthesis are important in other chemistry courses and personal professional development.

Metode poučevanja in učenja:	**Learning and Teaching Methods:**
Predmet se izvaja v obliki seminarjev in laboratorijskih vaj.	The course takes the form of seminars and laboratory exercises.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Pisni izpit po uspešno opravljenem praktičnem delu.	100 %	Written exam after successful completion of practical work.

Reference nosilca / Lecturer's references:

- **Andrej Pevec**: Syntheses and Solid-State and Solution Structures of $[Ba\{(C_5Me_5)_2Ti_2F_7\}_2(hmpa)]$ and $[Ba_8Ti_6F_{30}I_2(C_5Me_5)_6(hmpa)_6][I_3]_2$, Inorg. Chem. 2004, 43, 1250-1256.

- **Andrej Pevec**, Alojz Demšar, Jiri Pinkas, Merek Necas: Synthesis, spectroscopic and X-ray characterization of new molecular organotitanium(IV) phosphonate, Inorganic Chemistry Communications 2008, 11, 5-7.

- **Andrej Pevec**, Alojz Demšar: The variations in hydrogen bonding in hexafluorosilicate salts of protonated methyl substituted pyridines and tetramethylethylenediamine, Journal of Fluorine Chemistry 2008, 129, 707-712.

- **Andrej Pevec**, Martina Tekavec, Alojz Demšar: Cation-anion interactions involving hydrogen bonds: Syntheses and crystal structures study of hexafluorotitanate(IV) salts with pyridine and methyl substituted pyridines, Polyhedron 2011, 30, 549-555.