UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	KOORDINACIJSKA KEMIJA
Course Title:	COORDINATION CHEMISTRY

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
MAG Kemija, 2. stopnja	/	1.	1.
USP Chemistry, 2nd Cycle	/	1st	1st

Vrsta predmeta / Course Type: izbirni strokovni / Elective Professional

Univerzitetna koda predmeta / University Course Code: K2I01

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Work	Druge oblike študija	Samost. delo Individual Work	ECTS
15	15	45 LV	/	/	75	5

Nosilec predmeta / Lecturer: doc. dr. Bojan Kozlevčar / Dr. Bojan Kozlevčar, Assistant Professor

Jeziki / Languages:

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Študent oz. kandidat mora imeti predmet opredeljen kot študijsko obveznost.	The course has to be assigned to the student.

Vsebina:	Content (Syllabus outline):
Vsebina predmeta Koordinacijska kemija predstavlja nadaljevanje in nadgradnjo vsebine predmetov s področja anorganske kemije z dodiplomske stopnje (predmet Anorganska kemija II). Natančna karakterizacija spojin temelji na povezavi podatkov iz strukturne analize in analize realnega vzorca s povdarkom na: - določanju čistosti in istovetnosti snovi z znano spojino - ugotavljanju vrste kemijskih vezi v spojini - določanju načina koordinacije ligandov - opisu koordinativne sfere kovinskega iona - primerjavi strukturnih in analiznih podatkov s podatki kemijsko sorodnih spojin Splošne vsebine bodo predelali na predavanjih in seminarjih, praktične na vajah v laboratoriju.	A content of the subject Coordination Chemistry represents a continuation and upgrade of other subject contents in the inorganic chemistry field of the first cycle study programs (subject Inorganic Chemistry II) . The precise characterization of compounds is based on data correlation from the structural analysis and real samples analysis focussing on: - Purity and identity determination of the known compound - A type of the chemical bond analysis within the compound - Determining the ligands coordination mode - The coordination sphere of the metal ion description - A comparison of structural and analytical data with chemically related compounds

Vsebina vaj: Sinteza koordinacijaskih spojin na osnovi znanih literaturnih podatkov. Temu sledi natančna karakterizacija spojin s spektroskopskimi metodami, merjenjem magnetnih lastnosti ter prevodnosti. Vaje obsegajo uporabo metod rentgenske praškovne difrakcije, infra-rdeče in UV-vidne spektroskopije, magnetne susceptibilnosti ter električne prevodnosti. Dodatno se študentom predstavita tudi metodi elektronske paramagnetne in nuklearne magnetne resonance (EPR, NMR). Metode karakterizacije ter primeri spojin so izbrani tako, da študentom omogočajo celovit in zaokrožen opis sintetiziranih spojin. Eksperimentalne vaje potekajo v skupinah z dvema do štirimi študenti ob mentorstvu učitelja ali asistenta.	General contents will be processed by lectures and seminars, practical exercises in laboratory. Content of lab work: Synthesis of coordination compounds based on known literature data, followed by their detailed characterization with the spectroscopic , the magnetic susceptibility and the electrical conductivity methods. Practical methods include applying of X-ray powder diffraction, infra-red and UV-visible spectroscopy, magnetic susceptibility and electrical conductivity. Additionally, electron spin and nuclear magnetic resonance method (EPR, NMR) are presented to students. Characterization methods and compound examples are selected so that students can completely and thoroughly describe the synthesized compounds. Experiments are conducted in groups of two to four students with the assistance of a teacher or an assistant.

Temeljna literatura in viri / Readings:

J. D. Lee, Concise Inorganic Chemistry, Chapman and Hall, 5. Izd. 1996, 7., 32. poglavje.
B. Kozlevčar, Koordinacijska kemija, Navodila za vaje, študijsko gradivo, UL FKKT, 2013.
Dopolnilna literatura /additional readings:
A. K. Brisdon, Inorganic Spectroscopic Methods, Oxford Univ. Press, 1993.

Cilji in kompetence:	**Objectives and Competences:**
Cilji: Načrtovanje projekta, ki obsega iskanje literature za sintezni postopek, sintezo spojine, njeno analizo ter vrednotenje rezultatov s preverjanjem ujemanja rezultatov s podatki, navedenimi v objavljeni literaturi - Podrobnejša uporaba metod, primernih za karakterizacijo koordinacijskih spojin -Predstavitev in prikaz metod, ki so pri rutinski manj uveljavljene in se jih redkeje uporablja *Kompetence:* Študenti bi začrtane naloge opravili z čim večjo mero samostojnosti, kar predstavlja dejanski prehod med opravljanjem in reševanjem preprostejših izzivov, s katerimi se srečajo na osnovnem nivoju študija ter popolno samostojnostjo, ki se na ustreznem delovnem mestu pričakuje od človeka z zaključeno magistrsko stopnjo izobrazbe.	Planning of the project comprising searching of literature for the synthesis process, the synthesis of compounds, their analysis and evaluation of the results by checking the correlation of the results with the data specified in the published literature. - A detailed methods application, suitable for the characterization of coordination compounds -Presentation and display of the methods not routine, less established and not widely used Students shell outline the tasks performed by the largest possible autonomy, representing actual transition between the performance and the handling of simple challenges facing on a basic study level and the complete independence, which is at a specific working place expected for a person with the master's degree.

Predvideni študijski rezultati:	**Intended Learning Outcomes:**
Znanje in razumevanje Študenti so sposobni samostojno načrtovati sintezno shemo spojine, jo potem izpeljati in sintetizirano koordinacijsko spojino natančno okarakterizirati. Imajo pregled nad dosegljivimi metodami in znajo oceniti njihovo uporabnost.	Knowledge and Comprehension Students are independently able to design the coordination compounds synthesis scheme, perform the syntheses and accurately characterize them. Show an overview of the accessible methods and know how to evaluate their applicability**.**
Uporaba Strukturiranje izvedbe projekta je namenjeno predvsem reševanju zahtevnejših nalog, s katerimi se kemik pogosto sreča pri nadaljevanju študija ali v poklicu. Potek od želje po izolaciji spojine in uporabe postopkov za njeno karakterizacijo ter morebitno ocene njene praktične uporabnosti je pogosto zahteven in dolgotrajen. Metode, ki jih študentje srečajo in uporabljajo pri tem predmetu, so relativno pogosto uporabne in omogočajo razne analize, od rutinskih do bolj specifičnih.	Application The project execution is structuring primarily to complex tasks solving design, a chemist often meets at further studies or professional careers. The procedure from a desire for a compound isolation and its characterization and assessment of its potential practical application is often difficult and time consuming. The methods students meet and apply in this course are relatively often used thus enabling various analyses, from routine to more specific.
Refleksija Pridobljena znanja bodo študentu omogočila analizo izzivov pri reševanju nalog, s katerimi se bo srečeval v laboratoriju. Uporabil bo lahko primerno metodo, jo samostojno izpeljal ali celo vodil skupino ljudi pri določenem delovnem procesu.	Analysis The acquired knowledge will enable students to analyse the challenges at tasks addressing, which will be encountered in the laboratory. The appropriate method will be chosen, carried out independently or even as a group leader in a particular working process.
Prenosljive spretnosti Po končanem študiju bo izpeljava začrtane naloge na osnovi postavitve načrta izvedbe tista bistvena sposobnost, ki se od študenta pričakuje Skupaj z znanjem, potrebnim za iskanje primernih virov informacij, nujnih pri izvedbi delovnih postopkov na določenem delovnem mestu, bo to morda največja prednost takšne osebnosti.	Skill-transference Ability A derivation of the planned tasks, base on the set plan, shell be the essential skill, one would expect from the student after the graduation. Along with the knowledge needed to find appropriate information sources, being necessary at the work processes execution at the specific working place, this may be the largest advantage of such personalities.

Metode poučevanja in učenja:	**Learning and Teaching Methods:**
Projektno delo v manjših skupinah.	Seminar and laboratory project work in small groups

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**

Pisni izpit po uspešno opravljenem praktičnem delu. Ocene: pozitivno 6-10		Written exam after practical work successfully completed. Positive grades 6-10

Reference nosilca / Lecturer's references:

- KOZLEVČAR, Bojan, GAMEZ, Patrick, GELDER, René de, JAGLIČIĆ, Zvonko, STRAUCH, Peter, KITANOVSKI, Nives, REEDIJK, Jan. Counterion and solvent effects on the primary coordination sphere of copper(II) bis(3,5-dimethylpyrazol-1-yl)acetic acid coordination compounds. Eur. J. Inorg. Chem., 2011, 3650-3655, doi: 10.1002/ejic.201100410. [COBISS.SI-ID 35234309]
- KOZLEVČAR, Bojan, ŠEGEDIN, Primož. Structural analysis of a series of copper(II) coordination compounds and correlation with their magnetic properties. Croat. Chem. Acta, 2008, 81, 369-379, [COBISS.SI-ID 29994501]
- KOZLEVČAR, Bojan, LEBAN, Ivan, PETRIČ, Marko, PETRIČEK, Saša, ROUBEAU, Olivier, REEDIJK, Jan, ŠEGEDIN, Primož. Phase transitions and antiferromagnetism in copper(II) hexanoates : a new tetranuclear type of copper carboxylate paddle-wheel association. Inorg. Chim. Acta, 2004, 357, 4220-4230, [COBISS.SI-ID 1184649]