Univerza v Mariboru

Fakulteta za kemijo
in kemijsko tehnologijo

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Ime predmeta:	**Anorganska kemija**
Course title:	**Inorganic chemistry**

Študijski program in stopnja Study programme and cycle	Študijska smer Study option	Letnik Year of study	Semester Semester
Predmetni učitelj, usmeritev Izobraževalna kemija, enovit magistrski študij		**1.**	poletni
Subject Teacher, the major subject Educational Chemistry, Uniform master's studies		**1st**	Summer

Vrsta predmeta (obvezni ali izbirni) / Course type (compulsory or elective)	Obvezni Compulsory
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Vaje Tutorial			Klinične vaje Clinical training	Druge oblike študija Other forms of study	Samost. delo Individual work	ECTS
		AV	LV	RV				
45		**15**					**60**	**4**

Nosilec predmeta / Course coordinator:	**IRENA BAN**
Jeziki /Languages:	**Predavanja / Lectures:** Slovenski /Slovene
	Vaje / Tutorial: Slovenski /Slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites for enrolling in the course or for performing study obligations:**
NI	**NONE**

Vsebina (kratek pregled učnega načrta):

Predmet zajema osnove anorganske kemije. Periodni sistem kot osnova sistematike elementov in anorganskih spojin:

- Vodik, kisik in njune spojine-reprezentativni elementi
- 18. skupina PS - Žlahtni plini
- 17. skupina PS - Halogeni
- 16. skupina PS - Halkogeni
- 15. skupina PS
- 14. skupina PS
- 13. skupina PS

Content (syllabus outline):

The course covers the basics of inorganic chemistry. Periodic table as a basis of systematics of elements and inorganic compounds:

- Hydrogen, oxygen and their compounds-representative elements
- Group 18 of the PT – The Noble gases
- Group 17 of the PT – The Halogens
- Group 16 of the PT – The Chalcogens
- Group 15 of the PT - The Pnictogens
- Group 14 of the PT

• 2. skupina PS – zemljoalkalijske kovine • 1. skupina PS – alkalijske kovine • Kemija elementov prehoda (d-blok). Pregled in lastnosti prve vrste kovin prehoda. Pregled in lastnosti druge in tretje vrste kovin prehoda. • Kemija lantanoidov in aktinoidov (f-blok) • Jedrske reakcije • Kemija koordinacijskih spojin	• Group 13 of the PT • •Group 1 of the PT– The alkaline earth metals • • Group 2 of the PT – The alkali metals • Chemistry of transition elements (d-block). Overview and properties of the first row of transition metals. Overview and properties of the second and third rows of transition metals. • Chemistry of lanthanides and actinides (f-block) • Nuclear reactions • Chemistry of coordination compounds

Temeljni literatura in viri / Reading materials:

- D. F. Shriver, P. W. Atkins: *Inorganic Chemistry*, Oxford-University Press, 5th Ed (2010)
- F. Lazarini in J. Brenčič, Splošna in Anorganska kemija, Založba FKKT, Ljubljana (2011)

Dodatna priporočena literatura:

- M. Drofenik, Splošna in anorganska kemija, Fakulteta za kemijo in kemijsko tehnologijo – Univerza v Mariboru (2013)
- N. N. Greenwood , A. Earnshaw, Chemistry of the Elements, Second Edition Paperback – Elsevier Butterworth-Heinemann, 2009
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Cilji in kompetence:	**Objectives and competences:**
Študent bo razumel osnovne lastnosti reprezentativnih elementov periodnega sistema. Periodni sistem elementov je študentu osnova razumevanja in ureditev velikega števila kemijskih zakonitosti v obvladljivo shemo. Znanje mu bo pomagalo pri aktivni vključitvi v problematiko s področja anorganske kemije pri aktivni vključitvi v nadaljni študij po programu Predmetni učitelj – Izobraževalna kemija.	The student will understand the basic properties of representative elements of the periodic table The periodic table of elements is the student's basis for understanding and arranging a large number of chemical laws into a manageable scheme. The knowledge will help him/her to be actively involved in the field of inorganic chemistry and to be actively involved in further studies under the Subject Teacher – Educational Chemistry program.

Predvideni študijski rezultati:	**Intended learning outcomes:**

Znanje in razumevanje: • Študent je sposoben navesti osnovne značilnosti kemije elementov glavnih in stranskih skupin • Zna našteti in razložiti osnovne kemijske zakonitosti, ki vplivajo na periodične lastnosti elementov in njihovih spojin. • Zna opisati strukturne značilnosti, reaktivnost kemijskih spojin, pomembne kemijske reakcije ter uporabiti nomenklaturo anorganskih spojin. • Študent zna razložiti razvrščanje nekaterih kovin in polkovin kot kritičnih zaradi geoloških ovir, geopolitičnih in/ali ekonomskih dejavnikov. • Razume biodostopnost in toksičnost kovin v okolju. • Študent bo sposoben oceniti pomen osnovnih kemijskih zakonitosti in teoretskega znanja, in lastnosti za razlago eksperimentalnih dejstev. • Študent zna poiskati podatke iz strokovne literature, podatke iz virov medmrežja zna kritično oceniti. Uporabljati zna strokovni jezik (pisno in ustno).	Knowledge and understanding: • Student is able to state basic chemical characteristics of the main transition group elements in the periodic table • He/She is able to list and explain the basic chemical principles that have impact on the periodic properties of elements and compounds. • The student is able to describe structural features, reactivity of inorganic compounds, important chemical reactions and is able to use thenomenclature of inorganic compounds. • The student is able to explain the classification of some metals and metalloids as critical due to geological abundance, geopolitical and/or economic factors. • He/she Understands bioavailability and toxicity of metals in the environment. • The student is able to assess the meaning of basic chemical laws and theoretic knowledge in explaining experimental facts. • Student is able to find data from professional literature and is able to critically avaluate the data from the internet. He/She is able to use proffesional language (written and spoken).
Prenesljive/ključne spretnosti in drugi atributi: Pridobitev kemijskih znanj potrebnih za razumevanje ostalih kemijskih predmetov (organska, analizna in fizikalna kemija) Pridobitev splošnega kemijskega znanja za sodelovanje pri ostalih tehnoloških in naravoslovnih predmetih po programu Predmetni učitelj – Izobraževalna kemija.	**Transferable/Key Skills and other attributes:** Acquisition of chemical knowledge necessary for understanding other chemical subjects (organic, analytical and physical chemistry). Acquisition of general chemical knowledge for participation in other technological subjects and natural science subjects in the Subject Teacher – Educational Chemistry program.

Metode poučevanja in učenja:	**Learning and teaching methods:**

Predavanja in seminarske vaje Uporaba predstavitev s Power Point-om Uporaba interneta	~~Oral~~ Lectures and ~~Desk~~ Seminar-exercises Power-Point presentations Use of internet

Načini ocenjevanja:	**Delež**/Share (%)	**Assessment methods:**
Izpit je opravljen, če so pozitivno opravljene vse naslednje obveznosti: • pisni izpit Seminarski in teoretični del tvorita celoto. Izpit se lahko nadomesti tudi z dvema delnima testoma, ki prav tako vključujeta dodatne vsebine.	**100%**	Student has to pass successfully the following obligations: • written exam. The seminar and theoretical part form a whole. The exam can also be replaced by two tests, which also include additional content.

Reference nosilca / Course coordinator's references:

1 SUPERPARAMAGNETIC Fe3O4@CA nanoparticles and their potential as draw solution agents in forward osmosis [Elektronski vir] / Irena Petrinic ... [et al.]. - E-članek. - Ilustr. - Nasl. z nasl. zaslona. - Soavtorji: Janja Stergar, Hermina Bukšek, Miha Drofenik, Sašo Gyergyek, Claus Hélix-Nielsen and Irena Ban. - Opis vira z dne 22. 11. 2021. - Bibliografija: str. 15-17. - Abstract. - V: Nanomaterials (Basel). - ISSN 2079-4991. - Vol. 11, iss. 11 (4 Nov. **2021**), 17 str. - doi: 10.3390/nano11112965. - 620.3. - COBISS.SI-ID 85953027

2 SYNTHESIS of poly-sodium-acrylate (PSA)-coated magnetic nanoparticles for use in forward osmosis draw solutions [Elektronski vir] / Irena Ban ... [et al.]. - El. članek. - Ilustr. - Nasl. z nasl. zaslona. - Opis vira z dne 4. 9. 2019. - Soavtorji: Sabina Markuš, Sašo Gyergyek, Miha Drofenik, Jasmina Korenak, Claus Helix-Nielsen and Irena Petrinić. - Bibliografija: str. 16-17. - Abstract. - V: Nanomaterials (Basel). - ISSN 2079-4991. - Vol. 9, iss. 9 (1238) (Sep. **2019**), str. 1-17. - doi: 10.3390/nano9091238. - 620.3. - COBISS.SI-ID 22557462

3 SOL-gel preparation of NixCu1−x/silica nanocomposites using different silica precursors. - E-članek. - Nasl. z nasl. zaslona. - Opis vira z dne 19. 6. 2020. - Soavtorji: Irena Ban, Sašo Gyergyek, Uroš Maver, Janja Stergar. - Bibliografija: str. 8-9. - Abstract. - V: Journal of sol-gel science and technology. - ISSN 0928-0707. - (Published 18 June **2020**), str. [1-9]. - doi: 10.1007/s10971-020-05321-z. - 543.9. - COBISS.SI-ID 20266755

4 ADSORPTION of rare earth metals from wastewater by nanomaterials : a review / Tina Kegl ... [et al.]. - Soavtorji: Aljoša Košak, Aleksandra Lobnik, Zoran Novak, Anita Kovač Kralj, Irena Ban. - Članek št.: 121632. - Abstract. - Bibliografija: str. 26-29. - V: Journal of hazardous materials. - ISSN 0304-3894. - Vol. 386 (15 March **2020**), str. 1-29. - doi: 10.1016/j.jhazmat.2019.121632. - 628.3:620.3. - COBISS.SI-ID 22845718

5 NiCu-silica nanoparticles as a potential drug delivery system [Elektronski vir] / Janja Stergar ... [et al.]. - E-članek. - Nasl. z nasl. zaslona. - Opis vira z dne 17. 3. 2020. - Soavtorji: Uroš Maver, Marjan Bele, Lidija Gradišnik, Matjaž Kristl & Irena Ban. - Bibliografija: str. 10-12. - Abstract. - V: Journal of sol-gel science and technology. - ISSN 0928-0707. - (Published: 16 March 2020), str. [1-12]. - doi: 10.1007/s10971-020-05280-5. - 543.9. - COBISS.SI-ID 23066902