



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Kemija materialov
Course title: Chemistry of materials

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Izobraževalna kemija, 1. stopnja		2. ali 3.	zimski ali poletni
Educational Chemistry, 1 st degree			

Vrsta predmeta / Course type

Izbirni/elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Druge oblike študija	Samost. delo Individ. work	ECTS
20		10			150	6

Nosilec predmeta / Lecturer:

Miha Drofenik, Peter Krajnc

Jeziki /

Languages:

Predavanja / Slovenski/Slovenian

Lectures:

Vaje / Tutorial: Slovenski/Slovenian

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

Znanje splošne, anorganske in organske kemije.

Prerequisites:

Knowledge of general, inorganic and organic chemistry.

Vsebina:

- Keramika in steklo
- Polprevodniki in ionski prevodniki
- Kovinski materiali
- Naravni polimeri
- Sintetični polimeri

Content (Syllabus outline):

- Ceramics and glasses
- Semiconductors and ion conductors
- Metallic materials
- Natural polymers
- Synthetic polymers

Temeljni literatura in viri / Readings:

1. W. D. Kingery, H. K. Bowen, D. R. Uhlmann, *Introduction to Ceramics*, John Wiley & Sons (1975)
2. K.J. Rao, *Structural Chemistry of Glasses*, Elsevier (2002)
3. B. J. Hunt, M.I. James (Eds.): *Polymer Characterisation*, Chapman and Hall, Glasgow, 1993

Cilji in kompetence:

Namen predmeta je, da pridobi kandidat osnovno uporabno znanje za razvoj in raziskave anorganskih in organskih materialov.

Slušatelji se bodo seznanili s specifičnimi lastnostmi pomembnih skupin anorganskih materialov ter spoznali njihovo uporabnost v tehniki in medicini..

Objectives and competences:

The focus of the course is to acquire basic knowledge of inorganic and organic materials for its development and fundamental research.

Emphasis is given to learn the specific properties of important classes of inorganic materials and their applicability in technique and medicine.

Predvideni študijski rezultati:

Znanje in razumevanje:

Kandidat bo dobil temeljno in praktično znanje s področja pomembnih skupin anorganskih materialov uporabnih v tehniki in biomedicini.

Prenesljive/ključne spretnosti in drugi atributi:

Intended learning outcomes:

Knowledge and Understanding:

The candidate will be acquainted with the basic conception of some important classes of inorganic materials which can be used in technique and medicine.

Transferable/Key Skills and other attributes:

Metode poučevanja in učenja:

Predavanja, seminarsko delo, laboratorijske vaje.

Learning and teaching methods:

Lectures, seminar work, laboratory experiments.

Načini ocenjevanja:

Pisni izpit (ali kolokviji)
Ustni izpit

Delež (v %) /

Weight (in %)

Assessment:

Written exam (or partial exams)
Oral exam

Reference nosilca / Lecturer's references:

1. SEVŠEK, Urška, BRUS, Jiří, JEŘÁBEK, Karel, KRAJNC, Peter. Post polymerisation hypercrosslinking

of styrene/divinylbenzene poly(HIPE)s : creating micropores within macroporous polymer. *Polymer*, ISSN 0032-3861. [Print ed.], Jan. 2014, vol. 55, iss. 1, str. 410-415, doi: [10.1016/j.polymer.2013.09.026](https://doi.org/10.1016/j.polymer.2013.09.026). [COBISS.SI-ID [17174294](https://www.cobiss.si/id/17174294)]

2. JERENEC, Simona, ŠIMIĆ, Mario, SAVNIK, Aleš, PODGORNIK, Aleš, KOLAR, Mitja, TURNŠEK, Marko, KRAJNC, Peter. Glycidyl methacrylate and ethylhexyl acrylate based polyhipe monoliths : morphological, mechanical and chromatographic properties. *Reactive & functional polymers*, ISSN 1381-5148. [Print ed.], 2014, vol. 78, str. 32-37, doi: [10.1016/j.reactfunctpolym.2014.02.011](https://doi.org/10.1016/j.reactfunctpolym.2014.02.011). [COBISS.SI-ID [17661718](https://www.cobiss.si/id/17661718)]

3. PODGORNIK, Aleš, SMREKAR, Vida, KRAJNC, Peter, ŠTRANCAR, Aleš. Estimation of methacrylate monolith binding capacity from pressure drop data. *Journal of chromatography. A*, ISSN 0021-9673, 11. Jan. 2013, vol. 1272, str. 50-55, doi: [10.1016/j.chroma.2012.11.057](https://doi.org/10.1016/j.chroma.2012.11.057). [COBISS.SI-ID [16493846](https://www.cobiss.si/id/16493846)]

1. MERTELJ, Alenka, LISJAK, Darja, DROFENIK, Mihael, ČOPIČ, Martin. Ferromagnetism in suspensions of magnetic platelets in liquid crystal. *Nature*, ISSN 0028-0836, 2013, vol. 504, no. 7479, str. 237-241, doi: [10.1038/nature12863](https://doi.org/10.1038/nature12863). [COBISS.SI-ID [27304231](https://www.cobiss.si/id/27304231)]

2. HOJNIK, Nuša, KRISTL, Matjaž, GOLOBIČ, Amalija, JAGLIČIĆ, Zvonko, DROFENIK, Mihael. The synthesis, structure and physical properties of lanthanide(III) complexes with nicotinic acid. *Central European Journal of Chemistry*, ISSN 1895-1066, Feb. 2014, vol. 12, iss. 2, str. 220-226, ilustr., doi: [10.2478/s11532-013-0366-5](https://doi.org/10.2478/s11532-013-0366-5). [COBISS.SI-ID [17388822](https://www.cobiss.si/id/17388822)]

3. ZAJC, Igor, DROFENIK, Mihael. PTCR anomaly in barium-titanate-based composites. *Ceramics international*, ISSN 0272-8842. [Print ed.], 2014, vol. 40, no. 6, str. 8033-8036, doi: [10.1016/j.ceramint.2014.01.001](https://doi.org/10.1016/j.ceramint.2014.01.001). [COBISS.SI-ID [27620903](https://www.cobiss.si/id/27620903)]