



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	Študijska smer	Letnik	Semester
Study programme and level	Study field	Academic year	Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	3	Zimski
Five-year master's degree program Subject Teacher	/		Autumn

Vrsta predmeta / Course type

Izbirni / Elective

Univerzitetna koda predmeta / University course code:

Predavanja	Seminar	Vaje	Lab. vaje	Terenske vaje	Samost. delo	ECTS
Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	
20		10 SV			60	3

Nosilec predmeta / Lecturer:

Mihael Drofenik, Peter Krajnc

Jeziki /

Predavanja / Lectures:

slovenski / slovene

Languages:

Vaje / Tutorial:

slovenski / slovene

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

Prerequisites:

Znanje splošne, anorganske in organske kemije.

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. C. E. Carraher, Jr.: Introduction to polymer chemistry, CRC Press, 2010

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 uporabljenih 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.

Learning and teaching methods:

Lectures, seminar work.

Načini ocenjevanja:

Delež (v %) /

Assessment:

Weight (in %)

Pisni izpit	80	Written exam
Seminarska naloga	20	seminar paper

Opombe:

Pisni izpit se lahko nadomesti s kolokviji v enakem deležu.

Comments:

Written exam can be replaced by midterm exams in the same weight.

Reference nosilca / Lecturer's references:**Mihael Drofenik**

1. BAN, Irena, **DROFENIK, Mihael**, BUKŠEK, Hermina, PETRINIĆ, Irena, HÉLIX-NIELSEN, Claus, VOHL, Sabina, GYERGYEK, Sašo, STERGAR, Janja. Synthesis of magnetic nanoparticles with covalently bonded polyacrylic acid for use as forward osmosis draw agents. *Environmental science. Water research & technology*. **2023**, vol. 9, str. 442-453, ilustr. ISSN 2053-1419. 2. VOHL, Sabina, BAN, Irena, **DROFENIK, Mihael**, BUKŠEK, Hermina, GYERGYEK, Sašo, PETRINIĆ, Irena, HÉLIX-NIELSEN, Claus, STERGAR, Janja. Microwave Synthesis of Poly(Acrylic) Acid-Coated Magnetic Nanoparticles as Draw Solutes in Forward Osmosis. *Materials*. **2023**, vol. 16, iss. 11, [article no.] 4138, 15 str. ISSN 1996-1944. 3. ZAJC, Igor, **DROFENIK, Mihael**. The jump-like PTCR effect in a Ni–BaTiO₃ magnetic composite. *Journal of materials science. Materials in electronics*. [Online ed.]. **2022**, vol. 33, no. 10, str. 7648–7654. ISSN 1573-482X.

Peter Krajnc

1. PALJEVAC, Muzafera, VREČER, Gašper, BREN, Urban, KRAJNC, Peter. Bio-based polyHIPEs from eugenol-derived methacrylates : morphology and antibacterial activity. *Reactive and functional polymers*. Available online 17 March 2026, [article no.] 106732, 31 str. ISSN 1873-166X.
2. KOLER, Amadeja, KRAJNC, Peter. Myrcene-based porous polymers via emulsion templating and thiol-ene polymerization. *Monatshefte für Chemie*. [Online ed.]. 2026, vol. 157, str. 415-421, ilustr. ISSN 1434-4475.
3. PALJEVAC, Muzafera, PEČAR, Darja, KRAJNC, Peter. Efficient β -galactosidase immobilised on glycidyl methacrylate polyHIPE. *Polymer*. April 2025, vol. 325, [article no.] 128264, 10 str., ilustr. ISSN 1873-2291.