



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Eksperimenti 1
Course title:	Experiments 1

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	4.	7
Five-year master's degree program Subject Teacher	/	4 th	7

Vrsta predmeta / Course type

Obvezni / Obligatory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
25		35			120	6

Nosilec predmeta / Lecturer:

Matjaž Kristl

**Jeziki /
Languages:**

**Predavanja /
Lectures:**

slovenski / slovene

Vaje / Tutorial:

slovenski / slovene

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

Ni pogojev za vključitev v delo.

Prerequisites:

There are no prerequisites to enter the course.

Vsebina:

Content (Syllabus outline):

- vloga eksperimentalnega dela pri pouku kemije
- oblike eksperimentalnega dela
- priprava eksperimentalnega dela
- izvedba eksperimentalnega dela
- tehnike eksperimentalnega dela
- varnost pri eksperimentalnem delu
- laboratorijski inventar in kemikalije
- prostori za pouk kemije

- experiment in the chemical education
- forms of experimental work
- preparation of experimental work
- realization of experimental work
- technique of experiemntal work
- safety at experimental work
- laboratory inventory and chemicals
- rooms for chemisrty education

Temeljni literatura in viri / Readings:

- Roesky H.W., Spectacular chemical experiments, WILEY-VCH, 2007.
- Graunar, M.: Kemija danes 1: Delovni zvezek za kemijo v 8. razredu OŠ, DZS Ljubljana, 2021
- Dolenc, D., Graunar, M., Modec, B.: Kemija danes 2: Delovni zvezek za kemijo v 9. razredu OŠ, DZS Ljubljana, 2017
- Revije: Kemija v šoli (Ljubljana), Acta Chimica Slovenica (Ljubljana), Journal of Chemical Education (ZDA), Education in Chemistry (Velika Britanija), Chemie& Schule (Avstrija), Chemie in der Schule (Nemčija),

Dodatna literatura / Additional Readings:

- Roesky H.W., D. Kennepohl, Experiments in Green and Sustainable Chemistry, WILEY-VCH, 2009.
- Družina B., Nevarne snovi I., Univerza v Ljubljani, Visoka šola za zdravstvo, Oddelek za sanitarno inženirstvo, Ljubljana, 2004.

Cilji in kompetence:

Študenti prepoznajo vlogo in pomen eksperimentalnega dela pri pouku kemije, razumejo kriterije za izbiro izvedbenih oblik eksperimentalnega dela in uporabijo pridobljeno strokovno znanje za snovanje, načrtovanje, pripravo, izvajanje, analizo in vrednotenje eksperimentalnega dela pri pouku kemije. Študenti razvijejo eksperimentalne spretnosti osnovnih tehnik varnega laboratorijskega dela in se vpeljejo v inventariziranje, ravnanje in odstranjevanje različnega laboratorijskega inventarja.

Objectives and competences:

The students learn how to recognize the object and importance of experimental work in chemistry education, understand the criteria for the choice of experimental work forms and are able to use the obtained knowledge for planing, performing and analysing experimental work during chemistry education. The students delevope experimental skills for safe lab work and get used to regulating and organizing of laboratory inventory.

Predvideni študijski rezultati:

Znanje in razumevanje:

Študent zna izbrati metodiko eksperimentalnega pouka na stopnji obveznega kemijskega izobraževanja, obvlada eksperimentalne

Intended learning outcomes:

Knowledge and understanding:

The student is able to choose the methods of experimental teaching on the level of basic chemistry education, masters the basics of safe

spretnosti osnovnih operacij varnega laboratorijskega dela in zna načrtovati individualno/tandemsko eksperimentalno poučevanje in obvlada manipuliranje s šolskim laboratorijskim inventarjem in kemikalijami. Prenesljive/ključne spretnosti in novi atributi: Študent prenese pridobljene organizacijske in izvedbene spretnosti v poučevanje z metodo eksperimentalnega dela in razvija verbalne in neverbalne komunikacijske spretnosti lastne eksperimentalnemu poučevanju.	laboratory work, is able to plan individual / tandem experimental teaching and is able to handle school laboratory inventory and chemicals. Transferable/Key skills and other attributes: The student is able to transfer the obtained organisational and practical skills into teaching using the experimental method and develops verbal and non-verbal communication skills during experimental teaching.
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Metode poučevanja in učenja:

• Predavanja • Laboratorijske vaje • Samostojno delo
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Learning and teaching methods:

• Lectures • Laboratory work • Individual work
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Načini ocenjevanja:

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
• Ustni izpit • Laboratorijsko delo	50	• Oral exam • Laboratory work
	50	

Reference nosilca / Lecturer's references:

1. GOLOBIČ, Amalija, DOJER, Brina, JAGODIČ, Marko, SIHER, Anja, PEGAN, Anže, KRISTL, Matjaž. Synthesis and characterization of new copper(II) coordination compounds with methylammonium cations. <i>Inorganics</i>. 2024, vol. 12, iss. 10, [article no.] 261, 17 str. ISSN 2304-6740. https://doi.org/10.3390/inorganics12100261, DOI: 10.3390/inorganics12100261. [COBISS.SI-ID 211137027] 2. VOHL, Sabina, KRISTL, Matjaž, STERGAR, Janja. Harnessing magnetic nanoparticles for the effective removal of micro- and nanoplastics : a critical review. <i>Nanomaterials</i>. [Online ed.]. July 2024, vol. 14, no. 14, [art. no.] 1179, 39 str. ISSN 2079-4991. https://dk.um.si/IzpisGradiva.php?id=89573, DOI: 10.3390/nano14141179. [COBISS.SI-ID 202478851] 3. KRISTL, Matjaž, OSTROŠKO, Urška, BAN, Irena, PETRINIĆ, Irena, STERGAR, Janja. Thermal study of APTES-functionalized magnetite nanoparticles with citric acid and polyacrylic acid for advanced forward osmosis systems. <i>Journal of thermal analysis and calorimetry</i>. [Online ed.]. Published: 15

March 2024, 15 str., ilustr. ISSN 1588-2926. <https://dk.um.si/IzpisGradiva.php?id=89851>, DOI: [10.1007/s10973-024-12983-2](https://doi.org/10.1007/s10973-024-12983-2). [COBISS.SI-ID [189345283](https://cobiss.si/189345283)]

4. DOJER, Brina, KRISTL, Matjaž, ŠORGO, Andrej. The comparison of the speed of solving chemistry calculation tasks in the traditional way and with the use of ICT. *Acta chimica slovenica*. [Spletna izd.]. 2023, vol. 70, no. 4, str. 690-698, ilustr. ISSN 1580-3155. <https://acsi-journal.eu/index.php/ACSi/article/view/8485/10061>, DOI: [10.17344/acsi.2023.8485](https://doi.org/10.17344/acsi.2023.8485), DOI: [20.500.12556/DKUM-88286](https://doi.org/20.500.12556/DKUM-88286). [COBISS.SI-ID [178350339](https://cobiss.si/178350339)]

5. KRISTL, Matjaž, ŠTURM, Jaka, GOLOBIČ, Amalija, JAGLIČIĆ, Zvonko, DOJER, Brina. New copper(II) complexes with hydroxypyridines: Synthesis, structural, thermal, and magnetic properties. *Inorganica Chimica Acta*. [Print ed.]. Oct. 2023, vol. 556, 10 str. ISSN 0020-1693. DOI: [10.1016/j.ica.2023.121670](https://doi.org/10.1016/j.ica.2023.121670). [COBISS.SI-ID [157729283](https://cobiss.si/157729283)]