



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Laboratorijske tehnike
Course title:	Laboratory techniques

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		2.	letni
Five-year master's degree program Subject Teacher		2nd	spring

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
10	15	25			70	4

Nosilec predmeta / Lecturer:

Brina Dojer

Jeziki /

Languages:

Predavanja /

Lectures:

slovenski / slovene

Vaje / Tutorial:

slovenski / slovene

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

Jih ni.

Prerequisites:

None.

Vsebina:

Šolski kemijski laboratorij.

Najpogostejši materiali v kemijskem laboratoriju: steklo, keramika, polimeri, kovine.

Primerjalna analiza osnovnih operacij laboratorijskega dela v kurikulumih osnovnega in srednjega kemijskega izobraževanja.

Usposabljanje v tehnikah laboratorijskega dela – primeri kurikularnih eksperimentalnih sklopov osnovnega in srednjega kemijskega izobraževanja.

Mikroeksperimentiranje.

Content (Syllabus outline):

School chemistry laboratory.

Most frequently used materials in the chemistry laboratory: glass, ceramics, polymers, metals.

Comparative analysis of basic laboratory technique from compulsory and secondary chemical education curriculum.

Qualification for laboratory technique – experimental content cases from compulsory and secondary chemical education curriculum.

Microexperimenting.

Temeljni literatura in viri / Readings:

J. Sodja Božič, Laboratorijske tehnika, DZS Ljubljana 1992.

A. Krbavčič in sod., Kemijski priročnik (zbral in uredil M. Škrlič), SKD 2011

Osnovnošolski in srednješolski učni načrti predmeta kemija.

Kemijski osnovnošolski in srednješolski učbeniki ter delovni zvezki.

Cilji in kompetence:

Delo z učnimi načrti – iskanje ciljev in vsebin povezanih s kemijskimi eksperimenti.

Spoznavanje, uporaba in delo s kemijskim inventarjem.

Seznanitev z osnovnimi laboratorijskimi tehnikami v šolskem laboratoriju.

Uporaba primerne laboratorijske tehnike za zastavljen problem in izbira primerne inventarja.

Objectives and competences:

Working with curricula – searching aims and contents related to the chemical experiments. Learning about, using and working with the labware.

Demonstration of the basic laboratory techniques in the school laboratory.

Using the appropriate technique for the given task and select the appropriate labware.

Predvideni študijski rezultati:**Znanje in razumevanje:**

Po zaključku predmeta bo študent sposoben:

Intended learning outcomes:**Knowledge and understanding:**

On the completion of this course the student will be able to:

<ul style="list-style-type: none"> - Poiskati učne načrte za izbrani nivo osnovnega ali srednjega izobraževanja ter izbrati ustrezne eksperimente - Uporabiti ustrezno opremo in primeren inventar - Izvesti eksperimente na ustrezni težavnostni stopnji z upoštevanjem pravil varnosti in ekonomičnosti <p>Prenesljive/ključne spretnosti in drugi atributi:</p> <ul style="list-style-type: none"> - Uporaba laboratorijskega inventarja - Spretnost pri izvedbi vaj v učilnici in laboratoriju - Spretnost komuniciranja: predstavitev in zagovor seminarских vaj pred slušatelji 	<ul style="list-style-type: none"> - Find the syllabus of the chosen label of compulsory of secondary education and select appropriate experiments - Use the appropriate equipment and labware - Carry out the experiments on appropriate level of difficulty taking into account the rules of safety and economy <p>Transferable/Key Skills and other attributes:</p> <ul style="list-style-type: none"> - use of labware and equipment - laboratory skills during experimenting in the classroom and laboratory - communication skills: presentation and discussion of the seminar work in front of audience
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Metode poučevanja in učenja:

Predavanje Seminarско delo Laboratorijske vaje Samostojno delo

Learning and teaching methods:

Lectures Seminar work Laboratory work Individual work
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Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Seminarске naloge: a) Predstavitev b) Zagovor Laboratorijske vaje: a) kakovost načrtovanja b) kolokvij	 30 20 20 30	Seminar work: a) presentation b) discussion Laboratory work: a) quality of planning b) colloquium
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Reference nosilca / Lecturer's references:

1. DOJER, Brina, PEVEC, Andrej, BREZNIK, Katja, JAGLIČIĆ, Zvonko, GYERGYEK, Sašo, KRISTL, Matjaž. Structural and thermal properties of new copper and nickel single-source precursors. *Journal of molecular structure*. [Print ed.]. Oct. 2019, vol. 1194, str. 171-177, ilustr. ISSN 0022-2860. DOI: [10.1016/j.molstruc.2019.05.047](https://doi.org/10.1016/j.molstruc.2019.05.047). [COBISS.SI-ID [24538632](#)]
 financier: ARRS, Programi, P1-0403 (A), SI, Računsko intenzivni kompleksni sistemi

2. ŠORGO, Andrej, DOJER, Brina, GOLOB, Nika, REPNIK, Robert, REPOLUSK, Samo, PESEK, Igor, PLOJ VIRTič, Mateja, ŠPERNJAK, Andreja, ŠPUR, Natalija. Opinions about STEM content and classroom experiences as predictors of upper secondary school students' career aspirations to become researchers or teachers. *Journal of research in science teaching*. Dec. 2018, vol. 55, iss. 10, str. 1448-1468, ilustr. ISSN 0022-4308. DOI: [10.1002/tea.21462](https://doi.org/10.1002/tea.21462). [COBISS.SI-ID [23839240](#)]
 financier: ARRS, Programi, P2-0057 (B), SI, Informacijski sistemi

3. KRISTL, Matjaž, DOJER, Brina, GYERGYEK, Sašo, KRISTL, Janja. Synthesis of nickel and cobalt sulfide nanoparticles using a low cost sonochemical method. *Heliyon*. March 2017, vol. 3, iss. 3, str. 1-19. ISSN 2405-8440. <http://www.sciencedirect.com/science/article/pii/S2405844016322587>, DOI: [1016/j.heliyon.2017.e00273](https://doi.org/10.1016/j.heliyon.2017.e00273). [COBISS.SI-ID [20516118](#)]
4. DOJER, Brina, PEVEC, Andrej, JAGLIČIĆ, Zvonko, KRISTL, Matjaž. Cobalt(II) complexes with hydroxypyridines and halogenides. *Journal of molecular structure*. [Print ed.]. 2017, vol. 1128, str. 724-729. ISSN 0022-2860. DOI: [10.1016/j.molstruc.2016.09.023](https://doi.org/10.1016/j.molstruc.2016.09.023). [COBISS.SI-ID [22599688](#)]
5. DOJER, Brina, PEVEC, Andrej, JAGLIČIĆ, Zvonko, DROFENIK, Mihael, KRISTL, Matjaž. Nickel(II) pyridinecarboxamide complexes : solvothermal synthesis, crystal structures and magnetic properties. *Inorganica Chimica Acta*. [Print ed.]. 2016, vol. 446, str. 124-131. ISSN 0020-1693. DOI: [10.1016/j.ica.2016.03.002](https://doi.org/10.1016/j.ica.2016.03.002). [COBISS.SI-ID [22046984](#)]