



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Računalniško podprto laboratorijsko delo
Course title:	Computer supported laboratory work

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	/	5	Poletni Summer
Five-year master's degree program Subject Teacher	/		

Vrsta predmeta / Course type

Izbirni / Elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
5	10		30		45	3

Nosilec predmeta / Lecturer:

Andreja Špernjak

Jeziki /

Languages:

Predavanja /

Lectures:

slovenski/Slovene

Vaje / Tutorial:

slovenski/Slovene

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

Jih ni.

Prerequisites:

No prerequisites.

Vsebina:**Predavanja:**

Predmet je namenjen urejenju rabe informacijske in komunikacijske tehnologije (IKT) v razredu, predvsem:

- Praktične rabe IKT v izobraževanju;
- Virtualni računalniško podprt laboratorij
- Realni računalniško podprt laboratorij;
- Obogatena resničnost pri pouku biologije

Laboratorijske vaje

- Praktično delo: izvedba računalniško podprtih eksperimentov, mikropouk

Content (Syllabus outline):**Lectures:**

The intention of the subject is to master use of the information and communication technologies (ICT) in education through practical work, especially:

- Practical use of ICT in education;
- Virtual computer supported laboratory;
- Real computer supported laboratory;
- Augmented reality in biology lessons;

Laboratory exercises

- Practical work: set up of computer supported experiments; microteaching

Temeljni literatura in viri / Readings:

- Izbrana poglavja iz: Handbook of Research on Science Education. Ed. Norman G. Lederman, Dana L. Zeidler, Judith S. Lederman. 2023. Routledge.

Dodatna literatura:

- Šorgo, A. Računalniško podprt laboratorij pri pouku biologije v programu gimnazije. Zavod RS za šolstvo, 2005.
- Izbrani prispevki iz zbornikov konferenc MIPRO, iCERi, EDULearn, INTED,
- Spletni viri o uporabi umetne inteligence v poučevanju in obogatene resničnosti pri biologiji.

Cilji in kompetence:

Po izvedenem semestru naj bi študent-ka posedoval-a:

- teoretična in praktična znanja s področja didaktike in metodike vključevanja IKT v pouk biologije;
- spretnosti za pripravo, izvedbo in ovrednotenje dela učencev ter lastnega dela pri pouku biologije ob uporabi IKT.

Objectives and competences:

After completing the course a prospective teacher should possess:

- Theoretical and practical knowledge on the field of didactic and methodics on ICT in biology education.
- Skills needed for preparation, performance and assessment of student's and his/her own work in biology teaching using ICT.

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

- poznavanje in razumevanje pedagoško didaktično vsebinsko-tehnoloških znanj potrebnih za izvajanje pouka ob uporabi IKT;
- uporaba IKT v različnih kontekstih izobraževanja;
- sposobnost reševanje bioloških in drugih problemov povezanih s poučevanjem biologije z uporabo informacijsko-komunikacijske tehnologije;

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

- Knowledge about and understanding of technological pedagogical content knowledge needed for successful implementation of ICT in biology education;
- Use of ICT in different contexts;
- Competence in solving biological and other problems connected with biology education with the use of ICT.

• obvladovanje informacijskih tehnologij potrebnih za poučevanje biologije; Prenesljive/ključne spretnosti in drugi atributi: • Sposobnost povezovanja bioloških znanj z znanji drugih strok in ved ob uporabi IKT . • Upravljanje z IKT v izobraževanju	• Skills in manipulation with the information technology used in biology teaching; Transferable/Key Skills and other attributes: • Ability to connect biological science with the knowledge from other fields by using ICT. • Work with ICT in school.
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Metode poučevanja in učenja:	Learning and teaching methods:
• Predavanja • Laboratorijske vaje • Individualno delo	• Lectures • Laboratory excersises • Individual work

Delež (v %) / Weight (in %)		
Načini ocenjevanja:		Assessment:
• porfolijo;	50	• portfolio
• Ustni izpit	50	• oral exam

ŠPERNJAK, Andreja, RUPAR, Nina. Is digital technology necessary in practical field work in biology?. V: ABERŠEK, Boris (ur.), COTIČ, Mara (ur.). Challenges and transformation of education for 21st century schools. Newcastle-upon-Tyne: Cambridge Scholars Publishing, 2024. Str. 147-172

LANG, Vida, ŠPERNJAK, Andreja, ŠORGO, Andrej. The relationship between the daily use of digital technologies and the reading and information literacy skills of 15-year-old students. *European journal of educational research*. 2024, vol. 13, no. 1, str. 43-54

DOLENŠEK, Jurij, KOS, Tina, STOŽER, Andraž, ŠPERNJAK, Andreja (avtor, korespondenčni avtor). Teachers perception of the use on a low-cost pulse rate sensor for biology education. *Advances in physiology education*. Jun. 2022, vol. 46, iss. 2, str. 238-245.

MARIČIĆ, Mirjana, ANĐIĆ, Branko, MUMCU, Filiz, ROKOS, Lukáš, VONDRUŠKA, Jan, WEINHANDL, Robert, LAVICZA, Zsolt, ŠPERNJAK, Andreja. Evaluating the quality of technology integration across seven European countries with the ICAP technology scale. *Journal of computers in education*. 2024, [38] str. ISSN 2197-9995.
<https://doi.org/10.1007/s40692-024-00341-y>, DOI: 10.1007/s40692-024-00341-y.

ŠPERNJAK, Andreja, ŠORGO, Andrej. Differences in acquired knowledge and attitudes achieved with traditional, computer-supported and virtual laboratory biology laboratory exercises. *Journal of biological education*. 2018, vol. 52, iss. 2, str. 206-220

