



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / COURSE SYLLABUS

<b>Predmet:</b>	Didaktika matematike
<b>Course title:</b>	Didactics of Mathematics

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Matematika, 3. stopnja		1.	2.
Mathematics, 3 <sup>rd</sup> cycle		1 <sup>st</sup>	2 <sup>nd</sup>

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
45					225	9

Nosilec predmeta / Lecturer:

Jeziki / Languages:   
Predavanja / Lectures:  
Vaje / Tutorial:

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

Poglobljeno znanje in razumevanje temeljnih pojmov iz didaktike matematike.

**Prerequisites:**

Profound knowledge and understanding of fundamental notions in didactics of mathematics.

### Vsebina:

- Didaktika matematike kot znanstvena disciplina.
- Koncepti sodobne didaktike matematike.
- Pedagoško raziskovanje in metodologija. Analiza sodobnih raziskav s področja didaktike matematike.
- Teorije učenja. Učenje matematike. Učno okolje.
- Znanstvene paradigme in sodobne teorije.
- Sodobne teorije reševanja problemov. Metodologije raziskovanja sposobnosti reševanja problemov.
- Izobraževanje učiteljev. Prepričanja in odnos do matematike. Profesionalna rast učitelja.
- Odprti problemi. Prioritete v mednarodnih raziskavah pouka matematike.

Nekatere izmed teh tem so obdelane podrobneje, druge pa le na osnovni ravni. Pri izboru se upoštevajo interesi in raziskovalne usmeritve študentov.

### Content (Syllabus outline):

- Didactics of mathematics as a scientific discipline.
- Concepts in contemporary didactics of mathematics.
- Research design and methodology. Analysis of contemporary research in didactics of mathematics.
- Learning theories. Learning mathematics. Learning environment.
- Scientific paradigms and modern theories.
- Contemporary problem-solving theories. The research design for exploring problem-solving abilities.
- Teacher training. Attitudes toward and beliefs about mathematics. Teachers' professional development.
- Open problems. Priorities in international didactics of mathematics research.

Some of these topics are treated in detail and the others only at a basic level. The selection depends on students' interests and their research orientation.

### Temeljni literatura in viri / Readings:

- Dreyfus, T., Artigue, M., Potari, D., Prediger, S., & Ruthven, K. (Eds.). (2018). *Developing Research in Mathematics Education: Twenty Years of Communication, Cooperation and Collaboration in Europe*. Routledge.
- Kaiser, G., & Presmeg, N. (2019). *Compendium for early career researchers in mathematics education* (p. 532). Springer Nature.
- Trouche, L., Gueudet, G., & Pepin, B. (Eds.). (2019). *The 'resource' approach to Mathematics Education*. Springer Nature.

### Cilji in kompetence:

- Razviti poglobljeno razumevanje teoretskih in metodoloških konceptov s področja didaktike matematike.
- Razviti sposobnost samostojnega ustvarjanja novega znanja s področja didaktike matematike.
- Razviti sposobnost za samostojno reševanje najzahtevnejših problemov iz didaktike matematike.
- Razviti sposobnost izboljševanja znanih in odkrivanja novih rezultatov s področja didaktike matematike.
- Zmožnost razvijanja kritične refleksije na področju didaktike matematike.
- Razviti zmožnost vodenja najzahtevnejših znanstvenoraziskovalnih projektov s širšega področja didaktike matematike..

### Objectives and competences:

- To achieve a profound understanding of theoretical and methodological concepts of didactics of mathematics.
- To develop the ability to independently develop new knowledge in the field of didactics of mathematics.
- To develop the ability for solving the most challenging problems in didactics of mathematics.
- To develop the ability to improve known results as well as obtain new results in didactics of mathematics.
- Ability to develop critical reflection in didactics of mathematics.
- To develop the ability to lead the most challenging scientific research projects in the wider field of didactics of mathematics.

**Predvideni študijski rezultati:**

Znanje in razumevanje:  
poglobljeno razumevanje in uporaba raziskovalnih pojmov z izbranega področja področij didaktike matematike; primerjanje in kritična evalvacija najzahtevnejših pojmov didaktike matematike.

Prenesljive/ključne spretnosti in drugi atributi:  
spretnosti reševanja raziskovalnih problemov; spretnosti komuniciranja.

**Intended learning outcomes:**

Knowledge and understanding:  
profound understanding and use of research concepts in didactics of mathematics, comparing and critical evaluation of complex concepts of didactics of mathematics.

Transferable/Key Skills and other attributes:  
research problem-solving skills; communication skills.

**Metode poučevanja in učenja:**

predavanja;  
priprava seminarja;  
konzultacije;  
samostojni študij.

**Learning and teaching methods:**

lectures;  
seminar work;  
consultations;  
self-study.

Delež (v %) /

**Načini ocenjevanja:**

Weight (in %)

**Assessment:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt)  
seminarsko predavanje;  
pisni izdelek;  
ustni izpit.

20 %  
30 %  
50 %

Type (examination, oral, coursework, project):  
seminar talk;  
written work;  
oral examination.

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

- LIPOVEC, Alenka, FERME, Jasmina. Dokončevanje - pomembna posredna karakteristika matematičnih domačih nalog. *Pedagoška obzorja : časopis za didaktiko in metodiko*. 2020, letn. 35, [št.] 3/4, str. 3-18, ilustr., tabele. ISSN 0353-1392. [COBISS.SI-ID [44204803](#)], [SNIP, Scopus]  
Kategorija: 1A3
- LIPOVEC, Alenka, PODGORŠEK MESAREC, Manja. Prospective primary teachers' shift in locus of control and pedagogy focus. *Journal of mathematics teacher education*. 2021, vol. 24, iss. 4, str. 361–373. ISSN 1573-1820. <https://link.springer.com/article/10.1007/s10857-020-09463-3>, DOI: [10.1007/s10857-020-09463-3](https://doi.org/10.1007/s10857-020-09463-3). [COBISS.SI-ID [15387651](#)], [SNIP]  
Kategorija: 1A1
- LIPOVEC, Alenka. Learner-generated drawings : the case of fractions. V: ŽAKELJ, Amalija (ur.), et al. *Selected topics in the didactics of mathematics*. Koper: Založba Univerze na Primorskem, 2023. Str. 53-67, ilustr. Knjižnica Ludus, 42. ISBN 978-961-293-186-5. ISSN 2536-1937. [COBISS.SI-ID [138305283](#)]  
Kategorija: 3B
- SABO, Mateja, LIPOVEC, Alenka. What is and what is not mathematical modelling in primary school : opinions of Slovenian and Croatian primary school teachers = Što jest, a što nije matematičko modeliranje u razrednoj nastavi : mišljenja slovenskih i hrvatskih učitelja razredne nastave. *Hrvatski časopis za odgoj i obrazovanje : [CJE]*. [Tiskana izd.].

2022, vol. 24, no. 2, str. 539-568, tabele. ISSN 1848-5189. DOI: [10.15516/cje.v24i2.4451](https://doi.org/10.15516/cje.v24i2.4451). [COBISS.SI-ID [124172803](https://www.cobiss.si/COBISS.SI-ID/124172803)], [JCR]

5. PESTANO PÉREZ, Manuel, PESEK, Igor, ZMAZEK, Blaž, LIPOVEC, Alenka. Video explanations as a useful digital source of education in the COVID 19 situation. *Revija za elementarno izobraževanje*. [Tiskana izd.]. dec. 2020, letn. 13, št. 4, str. 395-412, tabele. ISSN 1855-4431. [http://rei.pef.um.si/images/Izdaje\\_revije/2020/04/REI\\_13\\_4\\_CLANEK2.pdf](http://rei.pef.um.si/images/Izdaje_revije/2020/04/REI_13_4_CLANEK2.pdf), DOI: [10.18690/rei.13.4.395-412.2020](https://doi.org/10.18690/rei.13.4.395-412.2020). [COBISS.SI-ID [42552323](https://www.cobiss.si/COBISS.SI-ID/42552323)], [SNIP]