Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	**Didaktika matematike**
Course title:	**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, 3rd cycle		**1st**	**2nd**

Vrsta predmeta / Course type	obvezni ali izbirni/compulsory or elective
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:	Alenka Lipovec

Jeziki / Languages:	**Predavanja / Lectures:**	Slovenski jezik; Slovene
	Vaje / Tutorial:	

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Poglobljeno znanje in razumevanje temeljnih pojmov iz didaktike matematike.	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. 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.
- English, Lyn D., and David Kirshner, eds. *Handbook of international research in mathematics education*. Routledge, 2015.
- Bikner-Ahsbahs, Angelika. *Networking of theories as a research practice in mathematics education*. Ed. Susanne Prediger. Dordrecht, The Netherlands: Springer, 2014.

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 of improving known results as well as obtaining 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:	**Intended learning outcomes:**
Znanje in razumevanje: poglobljeno razumevanje in uporaba temeljnih 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,	Knowledge and understanding: profound understanding and use of fundamental concepts in a chosen topics of 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:	**Learning and teaching methods:**
predavanja; priprava seminarja; konzultacije; samostojni študij.	lectures; seminar work; consultations; self-study.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt):		Type (examination, oral, coursework, project):
seminarsko predavanje;	**20 %**	seminar talk;
pisni izdelek;	**30 %**	written work;
ustni izpit.	**50 %**	oral examination.

Reference nosilca / Lecturer's references:

1. ANTOLIN DREŠAR, Darja, LIPOVEC, Alenka. Mathematical experiences and parental involvement of parents who are and who are not mathematicians. *Irish educational studies*, ISSN 0332-3315, 2017, vol. 36, no. 3, str. 357-374, doi: 10.1080/03323315.2017.1333445. [COBISS.SI-ID 23140872],
kategorija: 1A3; uvrstitev: Scopus (d)

2. PODGORŠEK MESAREC, Manja, LIPOVEC, Alenka. Self-assessment ability of pre-service teachers. *The new educational review*, ISSN 1732-6729, 2017, vol. 48, no. 2, str. 213-223. http://www.educationalrev.us.edu.pl/dok/volumes/tner_2_2017.pdf. [COBISS.SI-ID 23324680]
kategorija: 1A3; uvrstitev: Scopus (d)

3. LIPOVEC, Alenka, GREGORČIČ, Živa, ANTOLIN DREŠAR, Darja. Konceptualno znanje četrtošolcev po delu z interaktivnim učbenikom za matematiko. *Pedagoška obzorja : časopis za didaktiko in metodiko*, ISSN 0353-1392, 2015, letn. 30, [št.] 1, str. 60-74, ilustr. [COBISS.SI-ID 514126199]
kategorija: 1A3; uvrstitev: Scopus (d)

4. BEZGOVŠEK VODUŠEK, Helena, LIPOVEC, Alenka. The square as a figural concept = O quadrado como conceito figural. *Bolema : boletim de educação matemática*, ISSN 1980-4415, 2014, vol. 28, no. 48, str. 430-448. http://www.periodicos.rc.biblioteca.unesp.br/index.php/bolema/article/view/6527, doi:

10.1590/1980-4415v28n48a21. [COBISS.SI-ID 20569608
kategorija: 1A2; uvrstitev: Scopus (d),

5. LIPOVEC, Alenka, ANTOLIN DREŠAR, Darja. Slovenian pre-service teachers' prototype biography. *Teaching in higher education*, ISSN 1356-2517. [Print ed.], 2014, vol. 19, iss. 2, str. 183-193, doi: 10.1080/13562517.2013.836090. [COBISS.SI-ID 20096520]
kategorija: 1A1; uvrstitev: Scopus (d)