



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / COURSE SYLLABUS

<b>Predmet:</b>	Izbrana poglavja iz analize
<b>Course title:</b>	Selected topics in Analysis

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	/	3.	5.
Five-year master's degree program Subject Teacher	/		

**Vrsta predmeta / Course type**

**Univerzitetna koda predmeta / University course code:**

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45		30			105	6

**Nosilec predmeta / Lecturer:**

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

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

**Vsebina:**   
**Content (Syllabus outline):**

cilindrične in sferne koordinate. Integral s parametrom.

Krivulje in ploskve. Parametrizacija. Tangenta, tangentna ravnina. Dolžina krivulje, ploščina ploskve. Primeri.

cylindrical and spherical coordinates. Parameter-dependent integral.

Curves and surfaces. Parametrization. Tangent. Arc length, surface area. Examples.

#### Temeljni literatura in viri / Readings:

- F. in B. Brešar: *Analiza II*, Maribor: Feri, 2005
- F. in B. Brešar: *Analiza III*, Maribor: Feri, 2005
- G.F. Simmons, J.S. Robertson: *Differential equations with applications and historical notes*, New York: McGraw Hill, 1991.
- M. H. Protter, C. B. Morrey: *Intermediate calculus*. New York : Springer, 1985

#### Cilji in kompetence:

Študent se seznani s tistimi poglavji matematične analize funkcij več spremenljivk, ki so najbolj aktualna pri opisu situacij in reševanju problemov z različnih področij matematike, naravoslovje in širše.

#### Objectives and competences:

Student get insight in those chapters of the theory of functions of more variables that provide the most illustrative examples of applications of the theory to the description and solving problems in different areas of mathematics, sciences and wider.

#### Predvideni študijski rezultati:

- Študent spozna osnovna dejstva o funkcijah več spremenljivk in njihovi uporabi, predvsem pri ekstremalnih problemih.
- Seznani se z integracijo funkcij po merljivih množicah v prostoru.
- Izve najosnovnejše o krivuljah in ploskvah.

Prenesljive/ključne spretnosti in drugi atributi:

- Ilustracija dejstva, da nam teorija, navidez oddaljene od realnosti, lahko ponudi mnoge praktično uporabne rezultate.

#### Intended learning outcomes:

- Knowing basic facts about functions of several variables and being aware of the possible applications of this theory, specially in solving external problems.
- Knowing concepts of integration on measurable subsets of plane and space.
- Knowing the basic facts about curves and surfaces.

Transferable/Key Skills and other attributes:

- An illustration of the fact, that a more abstract theory can give us many nice results with useful practical applications.

#### Metode poučevanja in učenja:

- Predavanja
- Teoretične vaje

#### Learning and teaching methods:

- Lectures
- Theoretical exercises

Delež (v %) /

#### Načini ocenjevanja:

Weight (in %)

#### Assessment:

##### Izpiti:

Pisni izpit – problemi

50%

##### Exams:

Written exam – problems

<p>Ustni izpit – teorija</p> <p>Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.</p> <p>Opravljen pisni izpit – problemi je pogoj za pristop k ustnemu izpitu – teorija.</p>	<p>50%</p>	<p>Oral exam – theory</p> <p>Each of the mentioned assessments must be assessed with a passing grade.</p> <p>Passing grade of written exam – problems is required to take the oral exam – theory.</p>
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**Reference nosilca / Lecturer's references:**

1. JAKOVAC, Marko. The k-path vertex cover of rooted product graphs. *Discrete applied mathematics*, ISSN 0166-218X. [Print ed.], 2015, vol. 187, str. 111-119, doi: [10.1016/j.dam.2015.02.018](https://doi.org/10.1016/j.dam.2015.02.018). [COBISS.SI-ID [21355272](#)]
2. JAKOVAC, Marko. A 2-parametric generalization of Sierpiński gasket graphs. *Ars combinatoria*, ISSN 0381-7032, 2014, vol. 116, str. 395-405. [COBISS.SI-ID [17053529](#)]
3. YERO, Ismael G., JAKOVAC, Marko, KUZIAC, Dorota, TARANENKO, Andrej. The partition dimension of strong product graphs and Cartesian product graphs. *Discrete Mathematics*, ISSN 0012-365X. [Print ed.], 2014, vol. 331, str. 43-52. <http://dx.doi.org/10.1016/j.disc.2014.04.026>. [COBISS.SI-ID [20548104](#)]
4. BREŠAR, Boštjan, JAKOVAC, Marko, KATRENIČ, Ján, SEMANIŠIN, Gabriel, TARANENKO, Andrej. On the vertex k-path cover. *Discrete applied mathematics*, ISSN 0166-218X. [Print ed.], 2013, vol. 161, iss. 13/14, str. 1943-1949. <http://dx.doi.org/10.1016/j.dam.2013.02.024>. [COBISS.SI-ID [19859464](#)]
5. JAKOVAC, Marko, TARANENKO, Andrej. On the k-path vertex cover of some graph products. *Discrete Mathematics*, ISSN 0012-365X. [Print ed.], 2013, vol. 313, iss. 1, str. 94-100. <http://dx.doi.org/10.1016/j.disc.2012.09.010>, doi: [10.1016/j.disc.2012.09.010](https://doi.org/10.1016/j.disc.2012.09.010). [COBISS.SI-ID [19464968](#)]