UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Izbrana poglavja iz analize
Course title:	**Selected topics in Analysis**

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Izobraževalna matematika – dvopredmetni, 1. stopnja		**3.**	**5.**
Educational mathematics – Double-major, 1st degree		**3.**	**5.**

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: Joso VUKMAN

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

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

Prerequisits:

Jih ni.

There are none.

Vsebina:

Content (Syllabus outline):

Funkcije več spremenljivk, ekstremi, vezani ekstremi. Primeri uporabe.

Ploščina, volumen, dvojni, trojni integral. Polarne, cilindrične in sferne koordinate.

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

Functions of several real variables. Local and absolute extrema. Lagrange multipliers. Applications.

Area, volume. Double and triple integrals. Polar, cylindrical and spherical coordinates.

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

Diferencialne enačbe. Osnovni tipi navadnih diferencialnih enačb. Primeri uporabe.	Differential equations. Basic types of ordinary differential equations. Applications.

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:	**Objectives and competences:**
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.	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: **Intended learning outcomes:**

Znanje in razumevanje:	Knowledge and Understanding:
• 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. • Posveti se diferencialnim enačbam, s posebnim poudarkom na njihovi uporabi pri opisu in obravnavi konkretnih problemov. Prenesljive/ključne spretnosti in drugi atributi: • Ilustracija dejstva, da nam teorija, navidez oddaljene od realnosti, lahko ponudi mnoge praktično uporabne rezultate.	• Knowing basic facts about functions of several variables and being aware of the possible applications of this theory, specially in solving extemal problems. • Knowing concepts of integration on mesurable subsets of plane and space. • Knowing the basic facts about curves and surfaces. • Being familiar with ordinary differential equations and with their applications to concrete problems. 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: **Learning and teaching methods:**

• Predavanja • Teoretične vaje	• Lectures • Theoretical exercises

Načini ocenjevanja: **Assessment:**

Način (pisni izpit, ustno izpraševanje,	Delež (v %) /	Type (examination, oral, coursework,

naloge, projekt)	Weight (in %)	project):
Pisni test – praktični del	50%	Written test – practical part
Izpit (ustni) – teoretični del	50%	Exam (oral) – theoretical part
Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.		Each of the mentioned commitments must be assessed with a passing grade.
Pozitivna ocena pri pisnem testu je pogoj za pristop k izpitu.		Passing grade of the written test is required for taking the exam.
Reference nosilca / Lecturer's references:		

1. PERŠIN, Nina, VUKMAN, Joso. On certain functional equation arising from (m, n)-Jordan centralizers in prime rings. *Glas. mat.*, 2012, vol. 47, no. 1, str. 119-132. http://dx.doi.org/10.3336/gm.47.1.09. [COBISS.SI-ID 19107848]

2. FOŠNER, Maja, VUKMAN, Joso. On some functional equations in rings. *Commun. Algebra*, 2011, vol. 39, no 7, str. 2647-2658. http://dx.doi.org/10.1080/00927872.2010.488683. [COBISS.SI-ID 18550536]

3. FOŠNER, Maja, VUKMAN, Joso. Equations related to derivations on prime rings. *Glas. mat.*, 2011, vol. 46, no. 1, str. 31-41. http://dx.doi.org/10.3336/gm.46.1.06. [COBISS.SI-ID 18432520]

4. VUKMAN, Joso. Some remarks on derivations in semiprime rings and standard operator algebras. *Glas. mat.*, 2011, vol. 46, no. 1, str. 43-48. http://dx.doi.org/10.3336/gm.46.1.07. [COBISS.SI-ID 18432264]

5. FOŠNER, Ajda, FOŠNER, Maja, VUKMAN, Joso. Identities with derivations in rings. *Glas. mat.*, 2011, vol. 46, no. 2, str. 339-349. [COBISS.SI-ID 16050265]