

| UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18)                                |   |                                |                                     |   |   |             |
|--|---|--------------------------------|-------------------------------------|---|---|-------------|
| <b>Predmet:</b>  | Analiza 3                                   |                                |                                     |   |   |             |
| <b>Course title:</b>   | Analysis 3                                  |                                |                                     |   |   |             |
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| <b>Študijski program in stopnja</b><br><b>Study programme and level</b>                    | <b>Študijska smer</b><br><b>Study field</b> |                                |                                     | <b>Letnik</b><br><b>Academic year</b>           | <b>Semester</b><br><b>Semester</b>          |             |
| Interdisciplinarni univerzitetni študijski program Računalništvo in matematika             | ni smeri                                    |                                |                                     | 2   | prvi  |             |
| Interdisciplinary first cycle academic study programme<br>Computer Science and Mathematics | none  |                                |                                     | 2   | first                                       |             |
| <b>Vrsta predmeta / Course type</b>  |   |                                |                                     | obvezni / compulsory                            |   |             |
| <b>Univerzitetna koda predmeta / University course code:</b>                               |   |                                |                                     | 27207   |   |             |
| <b>Predavanja</b><br><b>Lectures</b>   | <b>Seminar</b><br><b>Seminar</b>            | <b>Vaje</b><br><b>Tutorial</b> | <b>Klinične vaje</b><br><b>work</b> | <b>Druge oblike študija</b>                     | <b>Samost. delo</b><br><b>Individ. work</b> | <b>ECTS</b> |
| 30   |   | 30                             |                                     |   | 90  | 5           |
| <b>Nosilec predmeta / Lecturer:</b>  |   |                                |                                     | prof. dr. Pavle Saksida, doc. dr. Aleš Vavpetič |   |             |
| <b>Jeziki / Languages:</b>   | <b>Predavanja / Lectures:</b>               |                                | slovenski / Slovene                 |   |   |             |
|  | <b>Vaje / Tutorial:</b>                     |                                | slovenski / Slovene                 |   |   |             |
| <b>Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:</b>               |   |                                |                                     | <b>Prerequisites:</b>                           |   |             |
| Vpis v letnik študija.   |   |                                |                                     | Enrolment in the programme.                     |   |             |
| Opravljena predmeta Analiza 1 in Analiza 2.  |   |                                |                                     | Completed courses Analysis 1 and Analysis 2.    |   |             |
| <b>Vsebina:</b>  |   |                                |                                     | <b>Content (Syllabus outline):</b>              |   |             |

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| <p>Večkratni integrali: integrali s parametrom, dvojni integral in večkratni integral, dolžina krivulje in površina ploskve.</p> <p>Sistemi diferencialnih enačb: obstoj in enoličnost rešitev, struktura prostora rešitev, sistemi s konstantnimi koeficienti, fazni prostor, stacionarne točke, stabilnost.</p> <p>Funkcije kompleksne spremenljivke: elementarne funkcije kompleksne spremenljivke, Cauchyjev izrek, residui in računanje integralov, transformacije kompleksne ravnine.</p> | <p>Multiple integrals: integrals with a parameter, double and multiple integrals, length of a curve, area of a surface.</p> <p>Systems of differential equations: existence and uniqueness of solutions, structure of the space of solutions, systems with constant coefficients, phase space, stationary points, stability.</p> <p>Functions of a complex variable: elementary functions of a complex variable, the Cauchy theorem, residues and evaluation of integrals, transformations of the complex plane.</p> |
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### Temeljni literatura in viri / Readings:

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| <p>Ivan Vidav: Višja matematika 2, Državna založba Slovenije, Ljubljana, 1979, 591 str.</p> <p>Erwin Kreyszig: Advanced engineering mathematics, 9th ed., J.Wiley, Hoboken, 2006.</p> <p>Gabrijel Tomšič, Tomaž Slivnik: Matematika III, Založba FE in FRI, Ljubljana, 2001, 175 str.</p> <p>Tomo Žitko: Zbirka nalog iz matematike III, Založba FE in FRI, Ljubljana, 2002, 92 str.</p> <p>Serge Lang: Calculus of several variables, Springer-Verlag, 1995.</p> |
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### Cilji in kompetence:

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| <p>Študent pri predmetu spozna nekaj novih pojmov in tehnik matematične analize, kot so dvojni in trojni integrali, reševanje diferencialnih enačb, kompleksna analiza. Te vsebine sodijo v uporabno matematiko in so nujno potrebne za razumevanje mnogih drugih predmetov, ki jih študent sreča pri študiju. Na predavanjih in vajah se študent uči matematičnega razmišljanja in strogosti, ter pridobiva praktično, delovno znanje obravnavanih področij.</p> |
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### Objectives and competences:

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| <p>By attending the course students get acquainted with some new notions and techniques of mathematical analysis, such as the double and the triple integrals, differential equations and complex analysis. These topics belong to the applied mathematics and are an essential component in the education of the students majoring in natural sciences or engineering. During the lectures and the classes students learn the mathematical rigor. They also acquire practical working knowledge of the topics, covered in the course.</p> |
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### Predvideni študijski rezultati:

### Intended learning outcomes:

Znanje in razumevanje:

Razumevanje in uporaba nekaterih zahtevnejših konceptov matematične analize.

Knowledge and understanding:

Understanding of certain advanced topics of mathematical analysis.

**Metode poučevanja in učenja:**

Predavanja, vaje, domače naloge, konzultacije.

**Learning and teaching methods:**

Lectures, classes, homework, consultations.

Delež (v %) /

Weight (in %) **Assessment:**

**Načini ocenjevanja:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt)

Type (examination, oral, coursework, project):

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

Pavle Saksida:

SAKSIDA, Pavle. On the nonlinear Fourier transform associated with periodic AKNS-ZS systems and its inverse. Journal of physics. A, Mathematical and theoretical, ISSN 1751-8113, 2013, vol. 46, no. 46, 465204 (22 str.). [COBISS.SI-ID 16833369]

SAKSIDA, Pavle. Integrable anharmonic oscillators on spheres and hyperbolic spaces. Nonlinearity, ISSN 0951-7715, 2001, vol. 14, no. 5, str. 977-994. [COBISS.SI-ID 10942809]

SAKSIDA, Pavle. Nahm's equations and generalizations Neumann system. Proceedings of the London Mathematical Society, ISSN 0024-6115, 1999, let. 78, št. 3, str. 701-720. [COBISS.SI-ID 8853849]

Aleš Vavpetič:

CENCELJ, Matija, DYDAK, Jerzy, VAVPETIČ, Aleš, VIRK, Žiga. A combinatorial approach to coarse geometry. Topology and its Applications, ISSN 0166-8641. [Print ed.], 2012, vol. 159, iss. 3, str. 646-658. [COBISS.SI-ID 16094809]

CENCELJ, Matija, DYDAK, Jerzy, MITRA, Atish, VAVPETIČ, Aleš. Hurewicz-Serre theorem in extension theory. *Fundamenta mathematicae*, ISSN 0016-2736, 2008, vol. 198, no. 2, str. 113-123. [COBISS.SI-ID 14551385]

CENCELJ, Matija, MRAMOR KOSTA, Neža, VAVPETIČ, Aleš. G-complexes with a compatible CW structure. *Journal of mathematics of Kyoto University*, ISSN 0023-608X, 2003, vol. 43, no. 3, str. 585-597. [COBISS.SI-ID 12807769]