|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **UČNI NAČRT PREDMETA / COURSE SYLLABUS** | | | | | | | | | | | | | | | | | |
| **Predmet:** | | | Matematika I | | | | | | | | | | | | | | |
| **Course title:** | | | Mathematics I | | | | | | | | | | | | | | |
|  | | | | |  | | | | | | | |  | |  | | |
| **Študijski program in stopnja**  **Study programme and level** | | | | | **Študijska smer**  **Study field** | | | | | | | | **Letnik**  **Academic year** | | **Semester**  **Semester** | | |
| Univerzitetni študijski program prve stopnje Elektrotehnika | | | | | **Ni smeri** | | | | | | | | 1. | | zimski | | |
| 1st cycle academic study programme Electrical Engineering | | | | |  | | | | | | | | **1.** | | **winter** | | |
|  | | | | | | | | | | | | | | | | | |
| **Vrsta predmeta / Course type** | | | | | | | | | | | | Obvezni – splošni/ compulsory general | | | | | |
|  | | | | | | | | | | | |  | | | | | |
| **Univerzitetna koda predmeta / University course code:** | | | | | | | | | | | | 64101 | | | | | |
|  | | | | | | | | | | | | | | | | | |
| **Predavanja**  **Lectures** | **Seminar**  **Seminar** | | | **Vaje**  **Tutorial** | | | **Klinične vaje**  **work** | | | | **Druge oblike študija** | | | **Samost. delo**  **Individ. work** | |  | **ECTS** |
| **60** |  | | | **45** | | |  | | | |  | | | **120** | |  | **9** |
|  | | | | | | | | | | | | | | | | | |
| **Nosilec predmeta / Lecturer:** | | | | | Gregor Dolinar | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | |
| **Jeziki /**  **Languages:** | | **Predavanja/Lectures:** | | | | slovenski | | | | | | | | | | | |
| **Vaje / Tutorial:** | | | | slovenski | | | | | | | | | | | |
| **Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:** | | | | | | | | |  | **Prerequisits:** | | | | | | | |
| Vpis v prvi letnik študija. | | | | | | | | |  | Enrolment in the first year of study. | | | | | | | |
| **Vsebina:** | | | | | | | |  | | **Content (Syllabus outline):** | | | | | | | |
| Številske množice (naravna števila, racionalna števila, realna števila, kompleksna števila). Zaporedja (stekališče, limita, omejenost). Številske vrste (konvergenca, kriteriji za konvergenco vrste, alternirajoča vrsta). Funkcije (definicijsko območje, zaloga vrednosti, sodost in lihost, injektivnost, surjektivnost, bijektivnost, kompozitum, inverzna funkcija, elementarne funkcije, limita, zveznost). Odvod funkcije (pravila za odvajanje, geometrijska interpretacija, diferencial, uporaba odvoda). Integral funkcije (nedoločeni integral, določeni integral, uporaba integrala). | | | | | | | |  | | Number systems (positive integers, rational numbers, real numbers, complex numbers). Sequences (accumulation points, limit, boundedness). Series (convergence, convergence tests, harmonic series, alternating series). Functions of one real variable (domain of definition, image, oddness and evenness, injectivity, surjectivity, bijectivity, composition, inverse function, elementary functions, continuity, limit). Derivative of a function (derivation rules, geometric interpretation, differential, applications). Integral of a function (indefinite integral, definite integral, applications of definite integral). | | | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Temeljni literatura in viri / Readings:** | | | | | |
| 1. G. Dolinar, Matematika 1, Založba FE in FRI, 2010.  2. P. Šemrl, Osnove višje matematike 1, DMFA-založništvo, 2009.  3. M. Akveld, R. Sperb, Analysis I, vdf Hochschulverlag, ETH Zürich, 2009.  4. G. B. Thomas: Thomas' Calculus, Pearson Education, 2005.  5. B. Jurčič-Zlobec, N. Mramor Kosta: Zbirka nalog iz Matematike I, Založba FE in FRI, 2009.  6. G. Dolinar, U. Demšar: Rešene naloge iz Matematike I za VSP, Založba FE in FRI, 2004.  Spletna učilnica eFE https://e.fe.uni-lj.si | | | | | |
| **Cilji in kompetence:** | |  | | **Objectives and competences:** | |
| Osvojiti osnovne pojme matematične analize ter razširiti in poglobiti njihovo razumevanje. Razvoj analitičnega razmišljanja in natančnega logičnega sklepanja. | |  | | To master the basic concepts of mathematical analysis and to be able to better understand them. To develop analytical thinking and careful and exact mathematical reasoning. | |
| **Predvideni študijski rezultati:** | | |  | **Intended learning outcomes:** | |
| Poznavanje in razumevanje osnovnih pojmov matematične analize, vključno z zaporedji, vrstami, funkcijami, odvodi in integrali. Sposobnost analize in matematične interpretacije tehničnih problemov. | | |  | Knowledge and understanding of the basic concepts of mathematical analysis, including sequences, series, real functions, derivatives, integrals. The ability to analyse and mathematically interpret technical problems. | |
|  | | |  |  | |
| **Metode poučevanja in učenja:** | | |  | **Learning and teaching methods:** | |
| Predavanja, avditorne vaje in individualizirane domače naloge. Skupinska analiza, interpretacija in reševanje tehničnih problemov. | | |  | Lectures, tutorials, and individualized homework. Collective analysis, interpretation, and solving of technical problems. | |
| **Načini ocenjevanja:** | Delež (v %) /  Weight (in %) | | | | **Assessment:** |
| Načini:  - domače naloge,  - pisni izpit,  - ustni izpit.  K izpitu lahko pristopijo tisti, ki pravilno rešijo določeno število domačih nalog in so prisotni na določenem številu avditornih vaj.  Ocenjevalna lestvica:  negativno (od 1 do 5),  pozitivno (od 6 do 10).  Pozitivna ocena na pisnem izpitu je pogoj za pristop k ustnemu izpitu. Pozitivna ocena na ustnem izpitu je pogoj za skupno pozitivno oceno.  Kandidat lahko opravi pisni izpit tudi z dvema kolokvijema.  Prispevki k oceni:  - pisni izpit,  - ustni izpit. | 50%  50% | | | | Types:  - homework assignments,  - writing exam,  - oral exam.  Only those who solve a predetermined number of homework assignments correctly and have a sufficient visit of tutorials can attend the exams.  Grading scale:  negative (1-5),  positive (6-10).  Positive grade at the writing exam is a prerequisite for the oral exam. Positive grade at the oral exam is a prerequisite for a positive final grade.  The candidate can also pass the final exam by attending two partial exams.  Contributions to final grade:  - writing exam,  - oral exam. |
| **Reference nosilca / Lecturer's references:** | | | | | |
| 1. DOLINAR, Gregor, KUZMA, Bojan, NAGY, Gergő, SZOKOL, Patrícia. Restricted skew-morphisms on matrix algebras. *Linear Algebra and its Applications*, ISSN 0024-3795, 2016, vol. 490, str. 1-17.  2. DOLINAR, Gregor, GUTERMAN, Aleksandr Èmilevič, MAROVT, Janko. Monotone transformations on B(H) with respect to the left-star and the right-star partial order. *Mathematical inequalities & applications*, ISSN 1331-4343, 2014, vol. 17, no. 2, str. 573-589.  3. DOLINAR, Gregor, GUTERMAN, Aleksandr Èmilevič, KUZMA, Bojan, OBLAK, Polona. Commuting graphs and extremal centralizers. *Ars mathematica contemporanea*, ISSN 1855-3966, 2014, vol. 7, no. 2, str. 453-459.  4. DOLINAR, Gregor, MOLNÁR, Lajos. Automorphisms for the logarithmic product of positive semidefinite operators. Linear and Multilinear Algebra, ISSN 0308-1087, 2013, vol. 61, no. 2, str. 161-169.  5. DOLINAR, Gregor, GUTERMAN, Aleksandr Emilevič, MAROVT, Janko. Automorphisms of K(H) with respect to the star partial order. Operators and matrices, ISSN 1846-3886, 2013, vol. 7, no. 1, str. 225-239. | | | | | |