Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

| UČNI NAČRT PREDMETA / COURSE SYLLABUS | | | |
|---|---|---|---|
| **Predmet:** | **Analiza II** | | |
| **Course title:** | Analysis II | | |

| **Študijski program in stopnja**<br>**Study programme and level** | **Študijska smer**<br>**Study field** | **Letnik**<br>**Academic year** | **Semester**<br>**Semester** |
|---|---|---|---|
| Matematika | | **2.** | **3.** |
| Mathematics | | **2.** | **3.** |

| | |
|---|---|
| **Vrsta predmeta / Course type** | |
| | |
| **Univerzitetna koda predmeta / University course code:** | |

| **Predavanja**<br>**Lectures** | **Seminar**<br>**Seminar** | **Sem. vaje**<br>**Tutorial** | **Lab. vaje**<br>**Laboratory work** | **Teren. vaje**<br>**Field work** | **Samost. delo**<br>**Individ. work** | **ECTS** |
|---|---|---|---|---|---|---|
| **60** | | **45** | | | **165** | **9** |

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|---|---|
| **Nosilec predmeta / Lecturer:** | Daniel Eremita |

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| **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):** |
| Integral: določeni integral, Riemannove in Darbouxjeve vsote; nedoločeni integral; Newton-Leibnizova formula; uporaba integrala; posplošeni integrali; Riemann-Stieltjesov integral.<br><br>Funkcijska zaporedja in vrste: konvergenca po točkah, enakomerna konvergenca; realne in kompleksne potenčne vrste; Taylorjeve vrste. | Integral: definite integral, Riemann and Darboux sums; indefinite integral; Newton-Leibniz formula; applications of integrals; improper integrals; Riemann-Stieltjes integral.<br><br>Sequences and series of functions: pointwise convergence, uniform convergence; real and complex power series; Taylor series. |

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| Fourierjeve vrste: ortogonalne funkcije, aproksimacija v normi, Fourierjevi koeficienti in Fourierjeva vrsta, Besselova neenakost; konvergenca v normi, Parsevalova enakost; trigonometrična vrsta, Fourierjeva vrsta glede na trigonometrični sistem ortogonalnih funkcij. | Fourier series: orthogonal functions, norm approximation, Fourier coefficients, Fourier series, Bessel's inequality; norm convergence, Parseval's equality; trigonometric series, Fourier series with respect to a trigonometric system of orthogonal functions. |

**Temeljni literatura in viri / Readings:**

M. Dobovišek, M. Hladnik, M.Omladič, Rešene naloge iz analize, DMFA, Ljubljana, 1980.
E. Fischer, Intermediate real analysis, Springer, 1983.
J. M. Howie, Real analysis, Springer, 2001.
B. Hvala, Zbirka izpitnih nalog iz analize, DMFA, Ljubljana, 1996.
F. Morgan, , Real analysis, AMS, 2005.
M. A. Robdera, A concise approach to mathematical analysis, Springer, 2003.
W. Rudin, Principles of mathematical analysis, McGraw Hill Book Co., 1976.
M. Stoll, Introduction to real analysis, 2nd edition, Pearson, 2001.
I. Vidav, Višja matematika I, II, DZS, Ljubljana, 1974.

| **Cilji in kompetence:** | **Objectives and competences:** |
|---|---|
| Razumevanje nekaterih zahtevnejših pojmov analize. | Understanding some advanced concepts of analysis. |

| **Predvideni študijski rezultati:** | **Intended learning outcomes:** |
|---|---|
| Znanje in razumevanje:<br>• Integrala.<br>• Funkcijskih zaporedij in vrst.<br>• Fourierjevih vrst.<br><br>Prenesljive/ključne spretnosti in drugi atributi:<br>• Pridobljena znanja so podlaga za večino predmetov v nadaljevanju študija. | Knowledge and Understanding:<br>• Integration<br>• Sequences and series of functions.<br>• Fourier series.<br><br>Transferable/Key Skills and other attributes:<br>• The obtained knowledge is a basis for most of the later subjects. |
| **Metode poučevanja in učenja:** | **Learning and teaching methods:** |
| • Predavanja<br>• Teoretične vaje | • Lectures<br>• Theoretical exercises |
| **Načini ocenjevanja:** | **Assessment:** |

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|---|---|---|
| Izpit: | Delež (v %) / Weight (in %) | Exams: |

| | | |
|---|---|---|
| Pisni izpit – problemi,<br>Ustni izpit – teorija.<br><br>Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.<br><br>Opravljen pisni izpit – problemi je pogoj za pristop k ustnemu izpitu – Teorija.<br><br>Pisni izpit – problemi se lahko nadomesti z dvema delnima testoma (sprotne obveznosti). | 50%<br>50% | Written exam – problems,<br>Oral exam – theory.<br><br>Each of the mentioned assessments must be assessed with a passing grade.<br><br>Passing grade of written exam – problems is required to take the oral exam – theory.<br><br>Written exam – problems can be repalced with two mid-term tests. |

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

1. EREMITA, Daniel. Biderivations on tensor products of algebras. *Communications in algebra*, ISSN 0092-7872, 2018, vol. 46, iss. 4, str. 1722-1726. http://doi.org/10.1080/00927872.2017.1355375, doi: 10.1080/00927872.2017.1355375.

2. EREMITA, Daniel. Commuting traces of upper triangular matrix rings. *Aequationes mathematicae*, ISSN 0001-9054, June 2017, vol. 91, iss. 3, str. 563-578. http://doi.org/10.1007/s00010-016-0462-7, doi: 10.1007/s00010-016-0462-7.

3. EREMITA, Daniel. Biderivations of triangular rings revisited. *Bulletin of the Malaysian Mathematical Society*, ISSN 0126-6705, Apr. 2017, vol. 40, iss. 2, str. 505-522. http://doi.org/10.1007/s40840-017-0451-6, doi: 10.1007/s40840-017-0451-6.

4. EREMITA, Daniel. Functional identities in upper triangular matrix rings. *Linear Algebra and its Applications*, ISSN 0024-3795. [Print ed.], 2016, vol. 493, str. 580-605. http://dx.doi.org/10.1016/j.laa.2015.12.022.

5. EREMITA, Daniel. Functional identities of degree 2 in triangular rings revisited. *Linear and Multilinear Algebra*, ISSN 0308-1087, 2015, vol. 63, iss. 3, str. 534-553. http://dx.doi.org/10.1080/03081087.2013.877012.