



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

| | |
|----------------------|------------|
| Predmet: | Analiza I |
| Course title: | Analysis I |

| Študijski program in stopnja Study programme and level | Študijska smer Study field | Letnik Academic year | Semester Semester |
|---|-------------------------------|-------------------------|----------------------|
| Matematika | | 1. | 2. |
| Mathematics | | 1. | 2. |

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 |
|------------------------|--------------------|-----------------------|------------------------------|---------------------------|-------------------------------|------|
| 60 | | 45 | | | 165 | 9 |

Nosilec predmeta / Lecturer:

| | | |
|--------------------------------|-----------------------------------|--|
| Jeziki / Languages: | Predavanja / Lectures: | <input type="text" value="SLOVENSKO/SLOVENE"/> |
| | Vaje / Tutorial: | <input type="text" value="SLOVENSKO/SLOVENE"/> |

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

Prerequisites:

Vsebina:

Realna števila: aksiomi; supremum, maksimum; koreni, iracionalna števila; intervali; absolutna vrednost.

Kompleksna števila: osnovne lastnosti; polarni zapis.

Zaporedja: konvergenca, operacije z zaporedji; monotona zaporedja, število e ; podzaporedja, stekališča; Cauchyjeva zaporedja.

Vrste: konvergenca; vrste s pozitivnimi členi; absolutna in pogojna konvergenca; vsota in produkt vrst.

Content (Syllabus outline):

Real numbers: axioms; supremum, maximum; roots, irrational numbers; intervals; absolute value.

Complex numbers: basic properties; trigonometric form.

Sequences: convergence, operations on sequences; monotone sequences, the number e ; subsequences, subsequential limits; Cauchy sequences.

Series: convergence, series of positive terms; absolute and conditional convergence; addition

Funkcije: limite; zveznost; monotone funkcije; zvezne funkcije na zaprtih intervalih, enakomerna zveznost; eksponentna in druge elementarne funkcije.

and multiplication of series.

Functions: limits, continuity, monotone functions; functions continuous on a closed interval, uniform continuity; exponential and other elementary 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.
 I. Vidav, Višja matematika I, DZS, Ljubljana, 1974.

Cilji in kompetence:

Razumevanje osnovnih pojmov analize.

Objectives and competences:

Understanding the basic concepts of analysis.

Predvideni študijski rezultati:

Znanje in razumevanje:

- Realnih in kompleksnih števil.
- Zaporedij in vrst.
- Limit in zveznosti funkcij.

Prenesljive/ključne spretnosti in drugi atributi:

- Pridobljena znanja so podlaga za večino predmetov v nadaljevanju študija.

Intended learning outcomes:

Knowledge and Understanding:

- Real and complex numbers
- Sequences and series
- Limits and continuity of functions.

Transferable/Key Skills and other attributes:

- The obtained knowledge is a basis for most of the later subjects.

Metode poučevanja in učenja:

- Predavanja
- Teoretične vaje

Learning and teaching methods:

- Lectures
- Theoretical exercises

Načini ocenjevanja:

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

Izpit:

Pisni izpit – problemi

Ustni izpit – teorija

Vsaka izmed naštetih obveznosti mora

50%

50%

Assessment:

Type (examination, oral, coursework, project):

Exam:

Written exam – problems

Oral exam – theory

Each of the mentioned assessments

| | | |
|--|--|---|
| <p>biti opravljena s pozitivno oceno.</p> <p>Opravljen pisni izpit – problemi je pogoj za pristop k ustnemu izpitu – teorija.</p> <p>Pisni izpit – problemi se lahko nadomesti z dvema delnima testoma (sprotne obveznosti).</p> | | <p>must be assessed with a passing grade.</p> <p>Passing grade of written exam – problems is required to take the oral exam – theory.</p> <p>Written exam – problems can be repalced with two mid-term tests.</p> |
| <p>Reference nosilca / Lecturer's references:</p> | | |
| <p>1. BANIČ, Iztok, ČREPNIJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš, SOVIČ, Tina. Ważewski's universal dendrite as an inverse limit with one set-valued bonding function. <i>Preprint series</i>, 2012, vol. 50, št. 1169, str. 1-33. http://www.imfm.si/preprinti/PDF/01169.pdf. [COBISS.SI-ID 16194137]</p> <p>2. BANIČ, Iztok, ČREPNIJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš. Paths through inverse limits. <i>Topol. appl.</i>. [Print ed.], 2011, vol. 158, iss. 9, str. 1099-1112. http://dx.doi.org/10.1016/j.topol.2011.03.001. [COBISS.SI-ID 18474504]</p> <p>3. BANIČ, Iztok, ŽEROVNIK, Janez. Wide diameter of Cartesian graph bundles. <i>Discrete math.</i>. [Print ed.], str. 1697-1701. http://dx.doi.org/10.1016/j.disc.2009.11.024, doi: 10.1016/j.disc.2009.11.024. [COBISS.SI-ID 17543176] tipologija 1.08 -> 1.01</p> <p>4. BANIČ, Iztok, ČREPNIJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš. Limits of inverse limits. <i>Topol. appl.</i>. [Print ed.], 2010, vol. 157, iss. 2, str. 439-450. http://dx.doi.org/10.1016/j.topol.2009.10.002. [COBISS.SI-ID 15310169]</p> <p>5. BANIČ, Iztok, ERVEŠ, Rijja, ŽEROVNIK, Janez. Edge, vertex and mixed fault diameters. <i>Adv. appl. math.</i>, 2009, vol. 43, iss. 3, str. 231-238. http://dx.doi.org/10.1016/j.aam.2009.01.005, doi: 10.1016/j.aam.2009.01.005. [COBISS.SI-ID 13396502]</p> | | |