



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:

Iztok BANIČ

Jeziki /

Languages:

Predavanja /

Lectures:

Vaje / Tutorial:

SLOVENSKO/SLOVENE

SLOVENSKO/SLOVENE

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

Jih ni.

Prerequisites:

There are none.

Vsebina:

Vrste: konvergenca; geometrijska vrsta; vrste s pozitivnimi členi, kriteriji za konvergenco; alternirajoče vrste; absolutna in pogojna konvergenca; vsota in produkt vrst.

Funkcije: osnovni pojmi; realne funkcije realne spremenljivke; elementarne funkcije; zveznost, enakomerna zveznost, zvezne funkcije na zaprtih intervalih; monotone funkcije; stekališča množice; limite.

Odvod: geometrijski pomen, pravila za odvajanje; odvodi elementarnih funkcij; izreki o srednji vrednosti, višji odvodi, Taylorjeva formula, lokalni ekstremini, L'Hospitalovo pravilo; konveksnost.

Content (Syllabus outline):

Series: convergence; geometric series; series of positive terms, convergence criteria; alternating series; absolute and conditional convergence; addition and multiplication of series.

Functions: basic concepts; real functions of one real variable; elementary functions; continuity, uniform continuity, functions continuous on a closed interval; monotone functions; accumulation points of a set; limits.

Differentiation: geometric interpretation, differentiation formulas; derivatives of elementary functions; mean value theorems, higher derivatives, Taylor's formula, local extrema, L'Hospital rule; convexity.

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, II, 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:

- Vrst.
- Realnih funkcij realne spremenljivke.
- Zveznosti in limit funkcij.
- Odvoda in njegove uporabe.

Prenesljive/ključne spretnosti in drugi atributi:

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

Intended learning outcomes:

Knowledge and Understanding of:

- Series.
- Real functions of one real variable.
- Continuity and limits of functions.
- Differentiation and its applications.

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:**Assessment:**

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

Reference nosilca / Lecturer's references:		
1. BANIČ, Iztok, ČREPNIJAK, Matevž. Markov pairs, quasi Markov functions and inverse limits. <i>Houston journal of mathematics</i>, ISSN 0362-1588, 2018, vol. 44, no. 2, str. 695-707. https://www.math.uh.edu/~hjm/restricted/pdf44(2)/16banic.pdf. 2. BANIČ, Iztok, ČREPNIJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš. The (weak) full projection property for inverse limits with upper semicontinuous bonding functions. <i>Mediterranean journal of mathematics</i>, ISSN 1660-5446, Aug. 2018, vol. 15, iss. 4, str. 1-21, doi: 10.1007/s00009-018-1209-6. 3. BANIČ, Iztok, ČREPNIJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš, SOVIČ, Tina. The closed subset theorem for inverse limits with upper semicontinuous bonding functions. <i>Bulletin of the Malaysian Mathematical Society</i>, ISSN 0126-6705, 2017, str. 1-12, doi: 10.1007/s40840-017-0517-5. 4. BANIČ, Iztok, TARANENKO, Andrej. Measuring closeness of graphs - the Hausdorff distance. <i>Bulletin of the Malaysian Mathematical Society</i>, ISSN 0126-6705, 2017, vol. 40, iss. 1, str. 75-95, doi: 10.1007/s40840-015-0259-1. 5. BANIČ, Iztok, ČREPNIJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš, SOVIČ, Tina. An Anderson-Choquet-type theorem and a characterization of weakly chainable continua. <i>Mediterranean journal of mathematics</i>, ISSN 1660-5446, 2017, vol. 14, iss. 2, str. 1-14, doi: 10.1007/s00009-017-0868-z.		