



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Osnove analize

Course title: Basic Analysis

Študijski program in stopnja
Study programme and level

Študijska smer
Study field

Letnik
Academic
year

Semester
Semester

Izobraževalna matematika – dvopredmetni, 1. stopnja		1.	2.
Educational mathematics – Double-major, 1 st degree		1.	2.

Vrsta predmeta / Course type

Obvezni / Obligatory

**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		30			90	6

Nosilec predmeta / Lecturer: Uroš Milutinović

Jeziki / Predavanja /
Languages: Lectures: SLOVENSKO/SLOVENE

Vaje / Tutorial: SLOVENSKO/SLOVENE

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

Jih ni.

Prerequisites:

There are none.

Vsebina:

Content (Syllabus outline):

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

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 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:		Learning and teaching methods:	
<ul style="list-style-type: none"> • Predavanja • Vaje • Individualno delo 		<ul style="list-style-type: none"> • Lectures • Tutorial • Individual work 	
Načini ocenjevanja:		Assessment:	
Način (pisni izpit, ustno izpraševanje, naloge, projekt)	Delež (v %) / Weight (in %)	Type (examination, oral, coursework, project):	
<u>Izpit:</u> Pisni izpit – problemi Ustni izpit – teorija Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno. Pozitivna ocena pri pisnem izpitu - problemi je pogoj za pristop k ustnemu izpitu – teorija. Pisni izpit – problemi se lahko nadomesti z dvema delnima testoma (ki sta sprotni obveznosti).	50% 50%	<u>Exams:</u> Written exam – problems Oral exam – theory Each of the mentioned assessments must be assessed with a passing grade. Passing grade of the written exam – problems is required for taking the oral exam – theory. Written exam – problems can be replaced by two mid-term tests.	
Reference nosilca / Lecturer's references:			
<ol style="list-style-type: none"> 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] 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] 3. 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] 4. KLAVŽAR, Sandi, MILUTINOVIĆ, Uroš, PETR, Ciril. Stern polynomials. <i>Adv. appl. math.</i>, 2007, vol. 39, iss. 1, str. 86-95. http://dx.doi.org/10.1016/j.aam.2006.01.003. [COBISS.SI-ID 14276441] 5. IVANŠIĆ, Ivan, MILUTINOVIĆ, Uroš. Closed embeddings into Lipscomb's universal space. <i>Glas. mat.</i>, 2007, vol. 42, no. 1, str. 95-108. [COBISS.SI-ID 14338393] 			