



UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

Predmet:	Analiza
Subject Title:	Analysis

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Matematika		1. ali 2.	1.
Mathematics		1. or 2.	1.

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Labor work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
60	0	0			240	10

Nosilec predmeta / Lecturer:

Jeziki / Predavanja / Lecture: Slovenski in angleški jezik; Slovene and English
Languages / Vaje / Tutorial:

Pogoji za opravljanje študijskih obveznosti:

Znanje osnovnih pojmov in rezultatov iz analize (zveznost, diferencirabilnost in integrabilnost; zaporedja in vrste).

Prerequisites:

Basic knowledge of fundamental notions and results of analysis (continuity, differentiability and integrability).

Vsebina:

Številska zaporedja in vrste; funkcijska zaporedja in vrste; funkcije več realnih spremenljivk, vključno z diferencirabilnostjo, izrekom o implicitni funkciji, Stokesovim in Greenovim izrekom; Riemann-Stieltjesov integral.

Lebesgueova mera in integral, osnovni pojmi abstraktne teorije mere, različni razredi funkcij, funkcije z omejeno variacijo, absolutno zvezne funkcije, aproksimacijski izreki, prostori L_p .

Kompleksna analiza, analitične funkcije, Cauchy-Riemannovi enačbi, Cauchyjeva integralska formula, singularnosti, teorija ostankov, zaporedja in vrste.

Nekatere izmed teh tem so obdelane podrobneje, druge pa le na osnovni ravni. Pri izboru se upoštevajo interesi in raziskovalne usmeritve študentov.

Content (Syllabus outline):

Numerical sequences and series; sequences and series of functions; topics in functions of several real variables, including differentiation, implicit function theorem, Stokes' and Green's theorems; Riemann-Stieltjes integration.

Lebesgue measure and integration theory, basic concepts from abstract measure theory, classes of functions, functions of bounded variation, absolutely continuous functions, approximation theorems, L_p spaces.

Complex analysis, analytic functions, Cauchy-Riemann equations, Cauchy integral formula, singularities, residue theory, sequences and series.

Some of these topics are treated in greater detail, and some of them only at a basic level. The selection depends on students' interests and their research orientation.

Temeljna literatura in viri / Textbooks:

- W. Rudin, Principles of mathematical analysis, McGraw-Hill, 1986
- W. Rudin, Real and complex analysis, McGraw-Hill, 1987
- R.C. Buck, E.F. Buck: Advanced calculus, McGraw-Hill, 1965
- M. Spivak: Calculus on manifolds, W.A. Benjamin, 1968
- W.H. Fleming: Functions of several variables, Springer, 1977
- M. Protter, C. Morrey, A first course in real analysis, Springer, 1991
- L.V. Ahlfors, Complex analysis, McGraw-Hill, 1979
- Z. Nehari, Conformal mapping, McGraw-Hill, 1952

Cilji:

- študenta seznaniti z osnovnimi področji sodobne analize;
- pripraviti podlago za poglobljeni študij nekaterih tem s področja analize;
- razvijati sposobnosti študenta za samostojno reševanje problemov in raziskovalno delo na tem področju.

Objectives:

- to get students acquainted with fundamental topics of modern analysis;
- to give students a basis for the advanced study of some special topics from analysis;
- to develop student's skills for solving problems and for research in analysis.

Predvideni študijski rezultati:

Znanje in razumevanje:

- poznavanje osnovnih področij analize;
- razumevanje osnovnih pojmov iz analize.

Prenesljive/ključne spretnosti in drugi atributi:

- podlaga za raziskovalno delo na področju analize;
- pridobljeno znanje za uporabo analize na drugih matematičnih področjih.

Intended learning outcomes:

Knowledge and understanding:

- knowledge of basic topics in analysis;
- understanding fundamental concepts of analysis.

Transferable/Key Skills and other attributes:

- a basis for research in analysis;
- knowledge needed for applying analysis to other mathematical areas.

Metode poučevanja in učenja:

- predavanja;
- priprava seminarja;
- praktični primeri;
- konzultacije;
- samostojni študij.

Teaching and learning methods:

- lectures;
- seminar work;
- practical exercises;
- consultations;
- self-study.

Načini ocenjevanja:

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

- seminar;
- reševanje praktičnih primerov;
- ustni izpit.

Delež (v %) /
Weight (in %)

20 %
30 %
50 %

Assessment methods:

Type (examination, oral, coursework, project):

- seminar;
- solutions of practical exercises;
- oral examination.