Study Program: Informatics

Type and level of studies: Bachelor studies

Course name: Mathematical analysis

Lecturer: Stojanović S. Vladica

Status: Compulsory

ECTS: 6

Attendance Prerequisites: /

Course aims

Enabling students to understand advanced mathematics through acquiring the basic notions of mathematical logic.

Course outcome

The students can enroll courses in advanced mathematics and use the previouslz acquired knowledge about algorhythm design.

Course content

Introducing mathematical analysis. Variables. Functional dependency. Ways of representing a function. Some specific classes of functions. Classification of functions. Limit processes. Limit of a variable. Main properties of limit values. Limit values of assigned variables. Limit of a function. Infinitely-small functions. Infinitely large functions. Basic theorems on function limits. Limit of a quotient sin x/x when x tends to 0. E constant. Comparing infinitely small values. Continuity of functions. Continuity at a point. Three important limits of functions. Points of discontinuity. Piecewise function properties.

Operations on continuous functions. Differential calculus. Derivatives. Tangent and normal lines to plane curves. Basic rules of differentiation. Limit values of basic elementary functions. Table of derivatives. Derivatives of parametric functions. Higher order derivatives. Differential of a function. Higher order differentials. Application of derivatives. Application of derivatives in function differentiation. Indefinite integrals. Basic methods of numerical integration. Method of undetermined coefficients. Some theorems on polynomic and rational functions. Integration of rational functions. Integration of trigonometric expressions. Integration of some irrational expressions. Definite integrals.

Area under a curve trapezium. Definite integrals. Application of definite integrals in geometry.

Literature

1. Душанка Перишић, Стеван Пилиповић, Мирјана Стојановић, Функције више променљивих, диференцијални и интегрални рачун, 1997.
2. D. Ćirić, Uvod u matematičku analizu, I deo, Prirodno-matematički fakultet, Niš, 2008.
3. G.B.Folland, Advanced Calculus, Prentice Hall 2001.

Number of active classes				Other classes
Lectures: 2	Practical classes: 2	Other forms of teaching:	Students' research work	

Teaching methods

Lectures, auditory lessons, consulting, term tests, homework, written exam.

Assessment (maximum 100 points)

Course assignments	**points**	Final exam	**points**
activity during lectures	**10**	written exam	**30**
practical classes		oral exam	**20**
term test(s)	**40**	.....	
seminar(s)			
Total	**50**		**50**