Study programmes: Bachelor studies – Mathematics

Course name: Convex analysis

Lecturers: Siniša Vrećica

Status: Compulsory

ECTS: 5

Attendance prerequisites: Linear algebra, Analysis 2

Course aims: Introduction of the students to the basic properties of convex sets and convex functions

Course outcome: The students acquire knowledge of the main properties of convex sets and convex functions and related notions. This will enable them to learn easily the following courses related to Optimization theory. Also, they get acquainted with the most important results in Combinatorial geometry.

Course content:
convex sets; topological and combinatorial properties of convex sets; the separation theorems; polar sets and their properties; convex functions; the criteria for convexity; the inequalities; the systems of inequations; continuity and differentiability of convex functions; conjugate functions; the families of convex sets; Blaschke theorem; the fixed point theorems

Literature:

1. S. Vrećica, Konveksna analiza, Matematički fakultet, Beograd, 1993.
2. F. Valentine, Convex sets, McGraw-Hill, New York, 1964.
3. J. van Tiel, Convex analysis, Wiley, New York, 1984.

Number of hours: 4	**Lectures: 3**	**Tutorials: 1**	**Laboratory: -**	**Research: -**

Teaching and learning methods: Frontal / Individual / Interactive / Tutorials / Lectures / Exercises

Assessment (maximal 100 points)

Course assignments	**points**	**Final exam**	**points**
Lectures	-	Written exam	30
Exercises / Tutorials	-	Oral exam	40
Colloquia	30	Written-oral exam	-
Essay / Project	-		