Course: Theory of polytopes

Teacher(s): Đorđe Baralić, PhD

Course status: elective

ECTS: 12+6

Prerequisites: -

Goal

The aim is to cover foundations of theory of convex polytopes and fundamental results, as well as some of applications in combinatorics, algebra, topology and geometry.

Outcomes

Students are familiar with basic notions and results necessary for following more advanced subjects in other courses related with polytopes.

Contents

Theoretical teaching

Different definitions of polytopes. Simplicial and simple polytopes. Neighborly polytopes. F and h vectors. G theorem. Upper bound theorem. Различите дефиниције политопа. Building sets and nestohedra. Graph associahedra. Permuthohedron and associahedron. Permuto-associahedron. Shellability. Schlegel's diagram. Gale's transformation.

Practical teaching

Software Polymake.

Recommended bibliography

Günter M. Ziegler, Lectures on Polytopes, Graduate Texts in Mathematics, Volume 152, Springer 1995

Active teaching hours: 30	Theoretical: 26	Practical: 4

Methods of teaching

26 theoretical sessions, monologue-dialogue method 4 classes of practical training in softwarePolymake.

Knowledge estimation: (max 100 points)

Seminar 35+project presentation35 + oral exam 30