Study programme(s): Mathematics	

Level: doctoral studies

Course title: Combinatorial group theory (AL-03)

Lecturer: Petar V. Marković

Status: elective

ECTS: 10

Requirements: Goup theory (M3-20)

Learning objectives:
Acquainting the students with basic concepts, results and proof techniques of modern group theory.

Learning outcomes:
The student will acquire understanding of basic concepts and methods which allow conducting research in the area of group theory.

Syllabus:
Presentations of semigroups and groups. Tietze transformations. Free groups. Varieties of groups. Free products. Subgroups of free products. The Grushko-Neumann theorem. Generalizations of free products. Automorphisms of free groups. Geometric methods. Cayley graphs of presentations. Van Kampen diagrams and the Van Kampen Lemma. Word problem and conjugacy problem. Britton's Lemma. The Dehn algorithm. Small cancellation theorem. One-relator groups and Magnus Theory.

Literature
1. R.Lyndon, P.Schupp, Combinatorial Group Theory, Springer-Verlag, Berlin, New York, 1977.
2. W.Magnus, A.Karrass, D.Solitar, Combinatorial Group Theory: Presentations of Groups in Terms of Generators and Relations, Interscience Publishers [John Wiley & Sons, Inc.], New York, London, Sydney, 1966.
3. М.Груловић, Основи теорије група, Универзитет у Новом Саду, 1997.

Weekly teaching load				Other: 0
Lectures: 2	Exercises 0	Other forms of teaching: 0	Student research: 6	

Teaching methodology
Lectures are presented using classical teaching methods. The students are given homework problems which are discussed in class throughout the semester. On one colloquium the students demonstrate their ability to independently solve problems related to the course material. The final exam is oral and the student is supposed to demonstrate a general understanding of the presented theoretical material.

Grading method (maximal number of points 100)			
Pre-exam obligations	**points**	**Final exam**	**Points**
Colloquium	30	Oral exam	70