Study programmes: PhD – Mathematics

Course name: Groups in geometry A

Lecturers: Mirjana Đ. Đorić, Zoran P. Rakić, Srđan N. Vukmirović

Status: Optional (compulsory for students in Geometry)

ECTS: 9

Attendance prerequisites: Lie groups and algebras

Course aims: Acquisition of general and specific knowledge in foundations of theory of Lie groups and algebras. Preparing student for advanced courses in this area. Introducing student for scientific work in this area.

Course outcome: Upon completion of the course, the student has necessary knowledge about basic notions such as: topological and Lie groups and algebras, left invariant and bi-invariant metrics on Lie group, Killing form. Student is qualified to individual understanding basic examples and solving problems from this area. Also, student is prepared for advanced courses.

Course content: Differentiable manifolds. Lie groups and algebras. Exponential mapping. Semigroups of Lie group. Topological group and homogeneous spaces. Abelian Lie groups. Covering spaces. Homomorphisms. Lienar groups. Automorphisms. Representations of Lie groups and algebras. Riemannian metric on Lie group. Left invariant and bi-invariant metrics on Lie group. Killing form.

Literature:

1. Alfred Gray, Lie groups, 1993, skripta.
2. A. W. Knapp, Lie groups, Lie Algebras and Cohomology, 1988, Mathematical Notes 34, Princeton University Press.
3. Hall B.C., Lie Groups, Lie Algebras, and Representations, 2003, GTM, Vol. 222, Springer-Verlag, New York-Heidelberg-Berlin

Number of hours: 10	**Lecures: 4**	**Tutorials: -**	**Laboratory: -**	**Research: 6**

Teaching and learning methods: Lectures/ Tutorials

Assessment (maximal 100 points)

Course assignments	**points**	**Final exam**	**points**
Lectures	-	Written exam	-
Exercises / Tutorials	20	Oral exam	60
Colloquia	-	Written-oral exam	-
Essay / Project	20		