Course Unit Descriptor

Study Programme: Mathematics (MA), Master Professor of Mathematics(M5)
Course Unit Title: Combinatorial Geometry
Course Unit Code: MA62
Name of Lecturer(s): Full Professor Olga Bodroža-Pantić
Type and Level of Studies: Master Academic Degree
Course Status (compulsory/elective): Elective
Semester (winter/summer): Summer
Language of instruction: Serbian
Mode of course unit delivery (face-to-face/distance learning): Face –to –face
Number of ECTS Allocated: 5
Prerequisites: None
Course Aims: Acquisition of basic knowledge on convex figures and introduction to the problems of combinatorial geometry, techniques and methods used.
Learning Outcomes: *Minimum:* Understanding the need to prove the existence of some geometric objects in some problems of combinatorial geometry and some basic ideas with which this is achieved. Comprehension of basic properties of convex figures and the application of theorems learnt. *Desired:* The successful student should be able to solve independently the problems of existence of some geometric objects and other more complex problems in combinatorial geometry using the adopted techniques.
Syllabus: *Theory* Basic concepts and theorems, Existential question, Jordan curve theorem , Convex figures, Supporting line of a figure, Convex bundle of rays, Convex hull (cover), Arrangement of points in the plane, Integer lattice, Plane tilings, Helly's theorem, Decomposition of a bounded figure into pieces with smaller diameter, Isoperimetric theorem *Practice* Techniques for proving the existence of geometric objects, Theta curve theorem, Points belonging to straight lines and circumferences, Properties of convex figures, Belonging to the convex hull of a set, Arrangement of points in the plane, Combinatorial problems on the integer lattice, Constructions of some tilings, Application of Helly's theorem.
Required Reading: 1.О.Бодрожа-Пантић, *Комбинаторна геометрија*, Универзитетски уџбеник, свеска 132, Универзитет у Новом Саду, 2001. 2. Г.Хадвигер, Г.Дебруннер, *Комбинаторная геометрия плоскости*, Наука, Москва, 1965. 3. Д.Шклярский, Н. Ченцов, И.Яглом, *Геометрические оценки и задачи из комбинаторной геометрии*, Наука, Москва, 1974 4. M.Yaglom, V.G.Boltyanskii, *Convex Figures*, Holt, Rinehart and Winston, New York, 1961.

Weekly Contact Hours:	**Lectures:** 2	**Practical work:** 2
Teaching Methods:		

Conventional methods of teaching are being used during the lectures.

Meanwhile, students practice their skills of understanding the problems and finding the possible solutions during the blackboard exercises.

Acquired knowledge and ability to solve the problems are continuously reassessed by means of tests and two colloquiums (preliminary exams).

At the final, oral exam, the student should be able to demonstrate a comprehensive understanding of the presented material.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Active class participation		written exam	
Practical work		oral exam	50
Preliminary exam(s)	50	…….	
Seminar(s)			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.