

Course Unit Descriptor

Study Programme: Computer Science – Master			
Course Unit Title: Geometric Algorithms			
Course Unit Code: CS756			
Name of Lecturer(s): Miloš Stojaković			
Type and Level of Studies: Master Academic Degree			
Course Status (compulsory/elective): Elective			
Semester (winter/summer): Summer			
Language of instruction: Serbian (primary), English (secondary)			
Mode of course unit delivery (face-to-face/distance learning): Face-to-face			
Number of ECTS Allocated: 6			
Prerequisites: Introduction to Algorithms, Discrete Structures 1			
Course Aims: Students should understand and grasp the basic properties of discrete geometric objects in 2D and 3D, as well as the standard algorithms that deal with these geometric objects.			
Learning Outcomes: Minimum: At the end of the course, it is expected that a student is familiar with the concept of computer processing of elementary discrete-geometric data structures. Desirable: At the end of the course, it is expected that a successful student is able to find a suitable algorithm for a given discrete geometric problem, to modify and adjust a standard algorithm if needed.			
Syllabus: Computing convex hull, line segment intersection, doubly-connected edge list. Point sets and polygons. Art gallery problems, guarding, triangulations. Range searching. Voronoi diagrams, generalizations. Delaunay triangulations. Convex hulls in 3-space. Binary space partitions, quadtrees. Robot motion planning.			
Required Reading: M. de Berg, M. van Kreveld, M. Overmars, O. Schwarzkopf, Computational Geometry, Springer Berlin Heidelberg, 2008. J. Matoušek, Lectures on discrete geometry, Springer, 2002.			
Weekly Contact Hours: 4	Lectures: 2	Practical work: 2	
Teaching Methods: Blackboard lectures, blackboard exercises.			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	Final exam	points
Active class participation		written exam	
Practical work		oral exam	70
Preliminary exam(s)	30	
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.			

