

Study programme(s): Computer Science				
Level: master				
Course title: Geometric Algorithms				
Lecturer: Miloš Stojaković				
Status: elective				
ECTS: 6				
Requirements: Introduction to Algorithms, Discrete Structures 1				
Learning objectives 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 <i>Minimum:</i> 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. <i>Desirable:</i> 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.				
Literature <ul style="list-style-type: none"> • M. de Berg, M. van Kreveld, M. Overmars, O. Schwarzkopf, <i>Computational Geometry</i>, Springer Berlin Heidelberg, 2008. • J. Matoušek, <i>Lectures on discrete geometry</i>, Springer, 2002. 				
Weekly teaching load				Other: 0
Lectures: 2	Exercises: 2	Practical Exercises: 0	Student research: 0	
Teaching methodology Blackboard lectures, blackboard exercises.				
Grading method (maximal number of points 100)				
Pre-exam obligations		points	Final exam	points
<i>Colloquia</i>		30	<i>Oral exam</i>	70