

<b>Study programmes:</b> Bachelor studies – Informatics				
<b>Course name:</b> M106 – Discrete Structures 2				
<b>Lecturers:</b> Zoran Stanić				
<b>Status:</b> Compulsory				
<b>ECTS:</b> 6				
<b>Attendance prerequisites:</b> No				
<b>Course aims:</b> Acquiring basic knowledge in combinatorics , graph theory and algorithms.				
<b>Course outcome:</b> Upon completion of the course students should have basic knowledge of combinatorics , graph theory and algorithms and to be able to apply them to practical problems . They should also be able to solve tasks in these areas and to follow more advanced courses in mathematics and computer areas in which they apply the concepts and techniques that he mastered.				
<b>Course content:</b> - Combinatorics: Enumerations. Set permutations. Set combinations. Binomial formula. Permutations and combinations of multisets. Polynomial formula. Formula inclusion-exclusion. The pigeonhole principle. Number partitions. Number of surjections. Stirling numbers of the first and the second kind. Bell numbers. Generating functions. Recurrence equations. Fibonacci numbers. - Graphs: Notion and types of graph, isomorphism. Walks, chains, paths and cycles. Connectivity. Planar graphs. Eulerian and Hamiltonian graphs. Travelling salesman problem. Shortest paths problem. Dijkstra and Floyd-Warshall algorithm. Trees. Kruskal and Prim algorithm for minimal spanning tree. Matrix representations. Graph colouring. Chromatic number. Linear programming problem. Simplex method. - Algorithm theory: Turing machine. Computability. Recursive functions. Complexity.				
<b>Literature:</b> 1. Z. Stanić, Diskretne strukture 2, Matematički fakultet, Beograd, 2018. 2. J. A. Anderson, Diskretna matematika sa kombinatorikom, Računarski fakultet, Beograd, 2005. 3. J. A. Bondy, U. S. R. Murty, Graph Theory, Springer, Berlin, 2011. 4. Đ. Dugošija, Linear programming, Zavod za udžbenke, Beograd, 2002.				
<b>Number of hours:</b> 5	<b>Lecures:</b> 3	<b>Tutorials:</b> 2	<b>Laboratory:</b> -	<b>Research:</b> -
<b>Teaching and learning methods:</b> Lectures and Exercises				
<b>Assessment (maximal 100 points)</b>				
<b>Course assignments</b>	<b>points</b>	<b>Final exam</b>		<b>points</b>
Lectures	10	Written exam		-
Exercises / Tutorials	-	Oral exam		-
Colloquia	30	Written-oral exam		60
Essay / Project	-			