Program	Level	First cycle
	Name of the program	Mathematics Education, Pure Mathematics

COURSE

Course title	**Discrete Mathematics**			
Course code	Semester	Course status	ECTS	Contact hours (L+AE+LE)
PMAT 185	II	Mandatory course	6	2+2+0
Lecturer				
Course Goals	The aim of the course is to familiarize students with some topics that are the subject of discrete studies of mathematics. The focus is on the basic principles and types of finite object counting set and multiset, and the basis of graph theory.			
Learning Outcomes	After successful completion of the course, the student is expected to: - Understand the basic concepts of counting theory, graph theory and finite automata, - To be able to apply different counting principles, - Summarize the theoretical basis of some basic graph theory algorithms and be able to apply those algorithms, - apply acquired knowledge to solve some concrete examples, - To be able to acquire and understand other knowledge from the field of discrete mathematics with which to meet in the continuation of education.			

COURSE CONTENT

- Logical tautologies; resolution principle; automatic inference,
- Valid predicate calculus formulas; positive test for the validity of formulas of predicate logic,
- Alternative logics; trivalent logic; fuzzy logic,
- Finite sets and multisets,
- Dirichlet's principle (weak, strong and general form),
- Principles of counting,
- Permutations and combinations of sets and multisets,
- Basic number theory algorithms,
- Recursive relations,
- Asymptotic notations and algorithm complexity analysis,
- The notion of a graph,
- Types and basic properties of graphs,
- Trees,
- The shortest path problem,
- Graph search (BFS, DFS),
- Minimum spanning tree (Prim's and Kruskal's algorithm).

LITERATURE

[1] D.Veljan, Kombinatorika sa teorijom grafova, Školska knjiga, Zagreb, 1989.
[2] K. Rosen, Discrete mathematics and its applications, 7th edition, McGraw Hill Publishing Co., 2012.
[3] R. Merris, Combinatorics, California State University, Hayward, 1996.

STUDENT WORKLOAD (hours in a semester)

Lectures	30	Exercises	45	Individual work	100	T o t a l	175

GRADING			**REMARKS**
Criterion	Maximum points	Minimum points	
Midterm exams	50	25	
Final exam	50	25	
Total	100	55	