

Study programme: Mathematics (M3)				
Level: bachelor				
Course title: Algebra 1 (M3-03)				
Lecturer: Andreja P. Tepavčević, Petar Dj. Djapić				
Status: obligatory				
ECTS: 8				
Requirements: none				
Learning objectives Systematization of basics of mathematics, logical rules of reasoning; developing the ability to properly and creatively solve mathematical problems.				
Learning outcomes Minimum: Mastering the rules of mathematical language and learning the basic proof techniques. Recognition and the ability to use tautologies and valid formulas. Mastering the basic constructions in set theory. Understanding and constructing of relations, particularly equivalence and order. Understanding the concept of function, and distinguishing function properties. Mastering methods for solving systems of linear equations, computing determinants and finding the inverse matrix. Desirable: Independent and creative use of rules and mathematical reasoning in solving complex problems and proving theorems. Understanding the construction and interpretation of models of predicate formulas. The ability to use knowledge of the functions and relations in other areas of mathematics and applications.				
Syllabi <i>Theoretical lessons</i> Propositional logic. Tautology, hypotheses and consequences. Canonical forms. Predicate logic. Interpretation of the model, valid formulas. Construction of mathematical theories: definitions, axioms, theorems, proof. Fundamentals of the naive set theory. The notion of relation. Equivalence relations and partitions. Ordering relations and ordered sets. Infimum and supremum, concept of a lattice. Function: basic concepts and features. The kernel of a functions. Families of sets. Equivalent sets, countable and uncountable sets, the cardinals. Systems of linear equations. Gaussian elimination. Determinants. Cramer's rule. Matrices. Calculation of inverse matrices and application to systems of linear equations. <i>Tutorial</i> Establishing rules and laws of mathematical and logical reasoning through the examples and problems from different mathematical fields. Constructing equivalence relations and quotient sets as well as of various types of functions and their application. Solving systems of linear equations, calculation of determinants and inverse matrices.				
Literature 1. B. Šešelja, A. Tepavčević, Algebra 1, teorija i zadaci, Symbol, Novi Sad, 2010.				
Weekly teaching load				Other: 0
Lectures: 3	Exercises: 3	Other forms of teaching: 0	Student research: 0	
Teaching methodology Lectures are presented using classical teaching methods and supported by beamer presentations. Exercises are aimed at practising and analysing typical problems and techniques of their solutions.				
Grading (maximum number of points 100)				
Pre-exam obligations	points	Final exam	points	
Colloquia	50	Oral exam	50	