

(Table 5.2) Course unit description

Study program: Mathematics				
Type and level of studies: Undergraduate academic studies				
Course unit: Discrete Mathematics				
Teacher in charge: Bojana Borovićanin				
Language of instruction: English				
ECTS: 6				
Prerequisites: None				
Semester (Winter Semester or Summer Semester): Summer				
Course unit objective Introduction to the basic concepts and theorems of number theory, combinatorics and graph theory. Training students to solve problems and tasks from the mentioned fields by using scientific procedures and methods.				
Learning outcomes of Course unit The student has acquired the necessary theoretical knowledge and understands the issues related to number theory, combinatorics and graph theory. The student has mastered the skills and methods of solving problems in these areas.				
Course unit contents <i>Theoretical classes:</i> Number theory. Basic divisibility theorems. The greatest common divisor. Euclid's algorithm. Prime numbers. Decomposing numbers into prime factors. Congruences. Systems of residues by given module. Application of congruences. Diophantine equations. Linear Diophantine equations. Pythagorean triples. Some nonlinear Diophantine problems. Combinatorics. Basic concepts and principles of combinatorics. Variations, permutations, combinations, partitions and compositions. On-off principle. Binomial formula and applications. Graph theory. Basic concepts of graph theory. Matrices in graph theory. Operations with graphs. Trees. Planar graphs. Graph coloring and graph chromatic number. Euler and Hamilton graphs. <i>Practical classes:</i> Application of the acquired theoretical knowledge in solving problems.				
Literature 1. R. Diestel, <i>Graph Theory</i> , Series: Graduate Texts in Mathematics, Vol. 173, Springer, Berlin, Heidelberg, 2017. 2. K. H. Rosen, <i>Discrete Mathematics and its Applications</i> , McGraw-Hill, 7 th edition, 2012.				
Number of active teaching hours				Other classes:
Lectures: 3	Practice: 2	Other forms of classes: 0	Independent work: 0	
Teaching methods Presentation and discussions, consultation with the professor, homework.				
Examination methods (maximum 100 points)				
Exam prerequisites	No. of points	Final exam	No. of points	
Practical classes		Written examination		
Tests	40	Oral examination	50	
Homework	10	Other		
Seminars				

Project			
Grading system			
Grade	No. of points	Description	
10	≥ 91	Excellent	
9	81-90	Exceptionally good	
8	71-80	Very good	
7	61-70	Good	
6	51-60	Passing	
5	≤ 50	Failing	