

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Discrete mathematics		Code 1010331421010342739
Field of study Information Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 2
Elective path/specialty -	Subject offered in: polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 2 Classes: 2 Laboratory: - Project/seminars: -		No. of credits 5
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 5 100%
Responsible for subject / lecturer: Prof. dr hab. Ryszard Płuciennik email: ryszard.pluciennik@put.poznan.pl tel. 61 665 33 20 Electrical Engineering ul. Piotrowo 3A, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of secondary school math.
2	Skills	K_U04: he is able to prepare and present a short presentation devoted to results of realization some engineering problems.
3	Social competencies	K_K01: he understand the need and knows possibilities permanent education (study of the first, the second and the third degree, postgraduted study, courses) - brushing up his language, professional and social competencies.
Assumptions and objectives of the course: The skill of interpretation of problems occurring in computer science into language of functions and relations. The skill of application to solving problems in computer science by using mathematical logic methods, technics of proving theorems, graph theory and recurrence.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Student has a basic knowledge in mathematics, containing the algebra, calculus, mathematical logic, probability theory, elements of discrete and applied mathematics. - [K_W01] 2. Student has well ordered knowledge supported theoretically in subject of fundamental algorithms and their analysing, technics of construction of them, abstract data structures and their implementation, hard counting problems. - [K_W04]		
Skills: 1. Student is able to work individually and in team. He can estimate time needed for assignet tasks, He can map out and realize schedules of tasks ensured defaulting of deadline. - [K_U02] 2. . Student has skills in self-education, among others in order to raising his professional competences. - [K_U05] 3. Student is able to find information in literature, data bases, and other sources. He is able to integrate found information, to interprete them, to deduce corollaries and to formulate opinion. - [K_U01]		
Social competencies: 1. Student is aware of importance of professional behaviour, applying of ethical principles and respecting plurality of ideas and cultures. - [K_K03] 2. Student has a knowledge of responsibility for his own work and he is ready to surrender to principles of team work and he is going to be responsible for commonly realized task. - [K_K04]		
Assessment methods of study outcomes		

<p>Lecture Valuation of knowledge and skills during oral and written exam. Practical Lessons Two large tests concerning an application of knowledge from the lectures in exercises (student can use his own notes) Systematic control of theoretical knowledge in form of short quizzes. Valuation of student answers during lessons. Valuation of activity during lessons.</p>		
Course description		
<p>Lectures: Elements of mathematical logic. Calculus of sentences. Tautologies. Sets, relations, sequences and functions in turn of discrete mathematics. Methods of proving theorems. Mathematical induction principle. Landau notation. Recurrence definitions and recurrence relations. Euclides algorithm. Fundamental counting problems. Combinatorics. Inclusion-exclusion principle. Binomial method. Directed and undirected graphs. Trees. An application of matrices to the description of graphs and relations. Representing graphs and graphs principle. Shortest path problems. Problems requiring of the theory of Latin squares. Rook polynomials and their applications. Course illustrated by many examples and counterexamples. Classes: Programmatic contents compatible with lectures. Solving of various kind of exercises. Problems requiring work in team. Putting forward problems leading to creating of algorithms for solution of complicated question in discrete mathematics. Creating of mathematical models for concrete real situations.</p>		
Basic bibliography:		
<ol style="list-style-type: none"> 1. R. L. Graham, D. E. Knuth, O. Patashnik, <i>Matematyka konkretna</i>, PWN, Warszawa 2002. 2. K.A. Ross, C.R.B. Wright, <i>Matematyka dyskretna</i>, PWN, Warszawa 2003. 		
Additional bibliography:		
<ol style="list-style-type: none"> 1. T.H. Cormen, C.E. Leiserson, R.L. Rivest, <i>Wprowadzenie do algorytmów</i>, PWN, Warszawa 2002. 		
Result of average student's workload		
Activity	Time (working hours)	
1. Attending in classes	60	
2. Individual konsultation with Lecturer	1	
3. Individual konsultation with Assistant	2	
4. Mastering of theoretical part of the subject	47	
5. Mastering of practical part of the subject	70	
Student's workload		
Source of workload	hours	ECTS
Total workload	180	5
Contact hours	30	0
Practical activities	30	0