STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Discrete mathematics**	Code **1010334421010342739**	
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) **part-time**

No. of hours				No. of credits
Lecture: **20**	Classes: **20**	Laboratory: **-**	Project/seminars: **-**	**6**

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 %**)** **6 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic mathematical knowledge from high school.
2	**Skills**	Ability to applications of basic combinatorial concepts.
3	**Social competencies**	Understanding necessity of broadening ones competences, readiness to working and cooperating in team and taking responsibility for jointly realized task.

Assumptions and objectives of the course:

The purpose of the course is to introduce students to basic discrete mathematics concepts and methods and possibilities of their applications in computer science.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student knows and understands basic theorems and methods in discrete mathematics. - [K_W01, K_W04]

2. Student knows basic types of practical issues using chosen combinatorial models. - [K_W04]

Skills:

1. Student can individually conduct exact reasoning using the achieved knowledge. - [K_U02]

2. Student recognizes possibilities of using discrete mathematics methods in computer science.   - [K_U01]

3. Student can construct recurrence equation describing a certain problem and solve it. - [K_U02, K_U07]

Social competencies:

1. Student appreciates the need and necessity of exact reasoning and continuous development. - [K_K01]

Assessment methods of study outcomes

Lecture: written exam.

Classes: evaluation of written test and the direct activity during the classes.

More than 50% points are necessary for passing the exam and test.

Course description

Elements of mathematical logic and methods of proving theorems: propositional calculus, tautologies, direct proof, proof by reductio ad absurdum, the principle of mathematical induction. Principles of counting, permutations and combinations, binomial coefficients, principle of inclusion exclusion.

Linear recurrence equations with constant coefficients.

The algorithm of Euclid for the calculation of the greatest common divisor, the Diophantine equations, the congruence calculus module a positive integer, the chines reminder theorem, Fermat's Theorem and Euler's Theorem, the Euler fi-function, the RSA crypto.

Basic bibliography:

1. J. Jaworski, Z. Palka, J. Szymański, Matematyka dyskretna dla informatyków, Wydawnictwo UAM, Poznań 2007.

2. W. Marzantowicz, P. Zarzycki, Elementarna teoria liczb, PWN 2006.

3. D. Bobrowski, Wprowadzenie do systemów dynamicznych z czasem dyskretnym, Wydawnictwo UAM, Poznań 1998

Additional bibliography:

1. R.L.Graham, D.E.Knuth, O.Patashnik, Matematyka Konkretna, Państwowe Wydawnictwo Naukowe, Warszawa 1996.

2. A. Szepietowski, Matematyka dyskretna, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2004.

Result of average student's workload

Activity	Time (working hours)
1. Lectures and classes	40
2. Final exam and consultations	10
3. Preparing for classes	15
4. Preparing for test	10
5. Preparing for the final exam	15

Student's workload

Source of workload	hours	ECTS
Total workload	100	6
Contact hours	50	3
Practical activities	50	3