STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Discrete mathematics		**1010334521010342739**
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: Lecture: **20** Classes: **20** Laboratory: **-** Project/seminars: **-**		No. of credits: **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** **Technical sciences**		ECTS distribution (number and %): **6 100%** **6 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic mathematical knowledge of mathematical logic, algebra and mathematical analysis.
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, K_W06]

Skills:

1. Student can individually conduct exact reasoning using the achieved knowledge. - [K_U02]
2. Student can construct recurrence equation describing a certain problem and solve it. - [K_U06]

Social competencies:

1. Student appreciates the need and necessity of exact reasoning and continuous development. - [K_K01]
2. Student is able search out some information in literature by oneself. - [K_K01]

Assessment methods of study outcomes

Lecture: written exam.

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

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.

Recursive dependencies. Fibonacci numbers. Linear recurrence equations with constant coefficients.

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

Basic bibliography:

1. J. Jaworski, Z. Palka, J. Szymański, Matematyka dyskretna dla informatyków, Wydawnictwo UAM, Poznań 2007.
2. Z. Palka, A. Ruciński, Wykłady z Kombinatoryki - Cz. I. Przeliczanie, WNT, Warszawa, 1998.
3. A. Szepietowski, Matematyka dyskretna, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2004.

Additional bibliography:

1. A. Iwaszkiewicz-Rudoszańska, Wstęp do algebry i teorii liczb, WN UAM 2009.
2. R.L.Graham, D.E.Knuth, O.Patashnik, Matematyka Konkretna, Państwowe Wydawnictwo Naukowe, Warszawa 1996.

Result of average student's workload

Activity	Time (working hours)
1. Lectures	20
2. Classes	20
3. Final exam and consultations	7
4. Preparing for classes	43
5. Preparing for tests	30
6. Preparing for the final exam	20

Student's workload

Source of workload	hours	ECTS
Total workload	140	6
Contact hours	47	3
Practical activities	93	3