STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Selected problems of mathematies		**1010332511010347153**

Field of study	Profile of study (general academic, practical)	Year /Semester
Information Engineering	**(brak)**	**1 / 1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
Second-cycle studies	**full-time**

No. of hours	No. of credits
Lecture: **15** Classes: **15** Laboratory: **-** Project/seminars: **-**	**3**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)

Responsible for subject / lecturer:

dr Maciej Grzesiak
email: maciej.grzesiak@put.poznan.pl
tel. 61 665 2807
Wydział Elektryczny
ul. Piotrowo 3A 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Differential and integral calculus, linear algebra and discrete mathematics as in first-cycle studies.
2	**Skills**	Ability to apply notions from calculus and linear algebra to problem solving. Skill in doing calculations (derivatives, integrals, matrices)
3	**Social competencies**	Understanding neccessity of further education. Self-discipline in achieving goals.

Assumptions and objectives of the course:

Introducing algebraic notions and showing how to operate them. Demonstrating their applications to information engineering. Achieving skills in reproducing and adapting typical algorithms which are useful in solving problems of counting theory.

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

Knowledge:

1. Ability to state and describe mathematical notions and important theorems concerning them and their practical applications. - [K_W01]

Skills:

1. Choose appropriate mathematical models to use in practical applications. - [K_U01]
2. Follow and reproduce typical algorithms. - [K_U05]

Social competencies:

1. Motivation for self-development and understanding that their own knowledge is limited. - [K_K01]

Assessment methods of study outcomes

Two tests (solving problems and knowledge of basic notions and theorems) in 7th and 14th week of the semester. Valuation of activity and student's answers during classes.

Course description

Cyclic, dihedral, and symmmetric group. Group homomorphisms. Quotient group. Groups acting on sets. Euclidean and matrix groups. Polya-Burnside'a counting method. Polynomial rings. Congruences and Chinese Remainder Theorem. Ideals and quotient rings. Finite fields.

Basic bibliography:

1. 1. W. J. Gilbert, W. K. Nicholson, Algebra współczesna z zastosowaniami, WNT, Warszawa 2008

Additional bibliography:

1. 1. K. A. Ross, C. R. B. Wright, Matematyka dyskretna, PWN, Warszawa 2012

Result of average student's workload

Activity	Time (working hours)
1. Lecture and practical lessons.	30
2. Individual consultations with the lecturer.	1
3. Consultations on practical lessons	2
4. Current work on lectures. Preparation to the tests	22
5. Problem solving	35
6. Final preparation to the examination and participation in it.	10

Student's workload

Source of workload	hours	ECTS
Total workload	100	3
Contact hours	33	0
Practical activities	35	0