STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Mathematics II**		Code **1010331211010341489**

Field of study **Automatic Control and Robotics**	Profile of study (general academic, practical) **practical**	Year /Semester **1 / 1**

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				No. of credits **6**
Lecture: **30**	Classes: **30**	Laboratory: **-**	Project/seminars: **-**	

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

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**	Mathematical knowledge from the secondary school
2	**Skills**	Ability to solve problems and mathematical modeling at the level of secondary school
3	**Social competencies**	Awareness of the need to broaden their competence, willingness to work together as a team

Assumptions and objectives of the course:

1.   Learning algebraic structures and m etod classical and linear algebra.
2.   Learning the methods and applications of analytic geometry.

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

Knowledge:

1. has knowledge of complex numbers, operations with complex numbers, complex numbers form and their applications - [K_W01]

2. has knowledge of the roots of polynomials, also in the set of complex numbers - [K_W01]

3. account has knowledge of the matrix, operations on matrices, determinants of matrices, inverse matrix calculation, the use of matrix to solve systems of linear equations - [K_W01]

4. have knowledge of basic algebraic structures - monoidów, groups, rings and fields - [K_W01]

5. has knowledge of n-dimensional vector space, database space, database changes, eigenvalues of matrix - [K_W01]

6. has knowledge of the operations on vectors in three-dimensional space, the basic geometric creations - a line, planes, quadrics - [K_W01]

Skills:

1. Can operate on complex numbers, contain certain types of complex roots of polynomials - [K_U05]

2. It can perform operations with matrices, inverse matrix method set of elementary operations, calculate the determinant of a matrix, solve the system of linear equations using Gaussian method of elimination - [K_U05]

3. able to recognize the structure of algebraic structures can be used monoidu and groups to describe of semi-automatic and automatic, - [K_U05]

4. It can determine the dimension of space and linear subspace, is able to do to change the database space, can solve the matrix eigenvalue problem. - [K_U05]

5. It can perform operations on vectors in three-dimensional space and apply the methods of vector calculus to describe lines and planes. It can classify surfaces of the second degree (quadrics). - [K_U05]

Social competencies:

1. He can think and act strictly in the area of process description in technical sciences - [K_K04]

Assessment methods of study outcomes

Update 2017

Lecture

?   assess the knowledge and skills listed on the written exam of a problematic

Classes:

?   knowledge test and rewarding than that for the accomplishment undue problems - solving

?   assessment of knowledge and skills - tests.

Course description

Update 2017

Applied methods of education: lectures and practical lessons.

Interactive lectures with problems and questions for students. The activity of students is taken into account in valuation of them. Discussion during lectures is expected. Connections with others mathematical subjects are indicated.

Relationships. Complex numbers and their applications, calculus matrix and its application in solving systems of linear equations, algebraic structures: monoidy, infinite and finite groups, rings, fields. Vector spaces of n-dimensional linear space, linear transformations, analytical geometry 3-dimensional space: plane, straight surfaces.

Basic bibliography:

1. A.Białynicki-Birula, Algebra, PWN Warszawa 1971 (i późniejsze),

2. A.Białynicki-Birula, Algebra liniowa z geometrią, PWN Warszawa 1976 (i późniejsze)

3. S. Przybyło, A. Szlachtowski, Algebra i wielowymiarowa geometria analityczna w zadaniach, WNT Warszawa 1992 (i późniejsze),

Additional bibliography:

1. M. Grzesiak, Liczby zespolone i algebra liniowa, Wydawnictwo PP, Poznań 1999,

2. G. Birkhoff, T.C. Bartee, Modern Applied Algebra, McGraw-Hill Book Company, New York 1970

Result of average student's workload

Activity	Time (working hours)
1. Lecture	30
2. Classes	30
3. Exam and consultation	10
4. Preparing to classes	40
5. Preparing to exam	30

Student's workload

Source of workload	hours	ECTS
Total workload	140	6
Contact hours	70	3
Practical activities	30	1