COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mathematics

Course

Field of study

Power Engineering

Year/Semester

1/1

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

20

Laboratory classes

Other (e.g. online)

Tutorials

20

Projects/seminars

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

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Institute of Mathematics

Faculty of Control, Robotics and Electrical Engineering

ul. Piotrowo 3A 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

1. Knowledge of mathematics of the secondary school ,

2. Ability to solve problems and mathematical modeling at the level of secondary school .

Course objective

1. Learning algebraic structures and methods of linear algebra,

2. Learning the methods and applications of differential calculus of functions of one variable.

Course-related learning outcomes

Knowledge

1. knows the rules of solving polynomials, exponentiation, and root in the set of complex numbers,

2. know the concept of matrix, the method of elementary operations on matrices, rules of solving systems of linear equations and calculating the determinants ,

3. knows the boundary term convergence of the series, the concept of derivative and calculation methods, the use of derivatives

Skills

1. solve the equation of the second degree with complex coefficients, determine the trigonometric form of a complex number

2. Perform addition and multiplication of matrices, calculate the inverse matrix, solve the system of linear equations, compute determinant

3. Calculate the derivative of a function of one variable, to examine the monotonicity intervals, calculate the extremes, expand the function in a Taylor and Maclaurin series.

Social competences

able to think and act strictly in the area of process description in technical sciences

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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

continuous evaluation for each course - short tests

assessment of knowledge and skills - test.

Programme content

Complex numbers - Gaussian form, trigonometric, Euler, exponentiation and roots, polynomials, roots of unity. Cash matrix - operations with matrices, inverse matrix, determinant of a square matrix, systems of linear equations and inequalities, the method of Gauss. Sequences - limitations, monotonicity, the limits of sequences, the number of e. Series of numbers - the concept of an infinite series, the sum of a number of criteria for convergence, power series. The concept features a complex function, the inverse function, limit and continuity of functions. Differential calculus of functions of one variable: the

derivative of a function differentiable functions extremes, the second derivative - convexity, concavity, inflection points, higher order derivatives, Taylor's formula, differential, rule of de L'Hospital.

Teaching methods

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. ..

Bibliography

Basic

1. I. Foltyńska, Z.Ratajczak, Z. Szafrański, Matematyka dla studentów uczelni technicznych część 1, Wydawnictwo PP Poznań 2000

2. I. Foltyńska, Z.Ratajczak, Z. Szafrański, Matematyka dla studentów uczelni technicznych część 2, Wydawnictwo PP Poznań 2000,

3. T. Jurlewicz, Z. Skoczylas, Algebra liniowa 1, Oficyna wydawnicza GiS, Wrocław 2002 (i późniejsze),

Additional

1. Stankiewicz W. Zadania z matematyki dla wyższych uczelni technicznych PWN Warszawa 2003

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for tutorials, preparation for tests/exam) [1]	50	2,0

[1] delete or add other activities as appropriate