POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mathematics

Course

Field of study	Year/Semester
Power Engineering	1/2
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
20		
Tutorials	Projects/seminars	
20		

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

dr Jacek Gruszka

email: jacek.gruszka@put.poznan.pl

tel. 61 665 2842

Institute of Mathematics

Faculty of Control, Robotics and Electrical Engineering

ul. Piotrowo 3A 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

1. Basic knowledge of complex numbers, matrix calculus, differentation from 1 semester

2. Ability solving problems with range of complex numbers, matrix calculus and differentation .

Course objective

The recognizing methods and applications of differential and integral calculus of functions of single and several variable.

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Course-related learning outcomes

Knowledge

1. knows the indefinite integral and definite integral and calculation methods, the application of integrals ,

2. to mean the idea of partial derivatives, to be able calculate extrema for functions of two variables

3. to comprehend the concept of multiple integral and know methods of calculation and applications -

4. to know types of differential equations and methods of their solving,

5. to understand the concept of The Laplace transform and know it properties and methods of calculation. Fourier series.

Skills

1. Calculate the indefinite integral, calculate the definite integral, determine field area, the length of the curve,

2. to calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field,

3. to calculate multiple and line integrals,

4. to recognize type of differential equation and solve it,

5. to apply the Laplace transform to solve linear differential equations and systems of linear differential equations with constant coefficients ,

3. to represent functions by the Fourier 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.

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Programme content

Integral calculus of functions of one variable indefinite integral - basic methods of integration. Definite integral, Riemann integral and its applications. Differential calculus of functions of several variables. Multiply integrals and their applications. Line integrals. Infinite series and power series.

First order differential equations. Differential equations of higher order-reduction of order. Linear differential equations of higher order. The Laplace transform and it application to differential equations. Fourier series.

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 2, Wydawnictwo PP Poznań 2000

2. I. Foltyńska, Z.Ratajczak, Z. Szafrański, Matematyka dla studentów uczelni technicznych część 3, Wydawnictwo PP Poznań 2000,

Additional

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

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for tutorials, preparation for tests/exam) [1]	75	3,0

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[1] delete or add other activities as appropriate