STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Mathematics		**1010324321010340025**

Field of study	Profile of study (general academic, practical)	Year /Semester
Electrical Engineering	**(brak)**	**1 / 2**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**

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

No. of hours				No. of credits
Lecture: **36**	Classes: **26**	Laboratory: **-**	Project/seminars: **-**	**6**

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 %)
the sciences	**6 100%**

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	The basic knowledge of differential and integral calculus. - [K1_W01 (P6S_WG)]
2	**Skills**	Students should be able to reformulate some formulas and equations, and to calculate derivatives and integrals. - [K1_U10 (P6S_UW)]
3	**Social competencies**	Students should know the boundedness of their knowledge and understand the need of further education. - [K1_K01 (P6S_KK)]

Assumptions and objectives of the course:

The recognizing methods and applications of vector calculus, differential and integral calculus of functions of two and three variables. The getting to know applications of multiply integrals in mathematics and physics.

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

Knowledge:

1. To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K1_W01 (P6S_WG)]
2. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K1_W01 (P6S_WG)]

Skills:

1. To calculate partial derivatives, extrema for functions of two variables - [K1_U10 (P6S_UW)]
2. To calculate multiple integrals used in some technical problems - [K1_U10 (P6S_UW)]

Social competencies:

1. Students understand the importance of effective using of mathematics in other areas of science - [K1_K01 (P6S_KK)]

Assessment methods of study outcomes

Lecture

A written exam.

Tutorials

Short tests during the term (50%) and final test at the end of the term (50%) (additional points for activity).

Course description

Applied methods of teaching: lectures on the blackboard; tutorials - solving problems on the blackboard and discussing

solutions.

Matrix calculus: arithmetic operations on matrices, determinants, the inverse of matrix, solving of systems of algebraic linear equations.

Vectors, their coordinates and properties. Applications of vector calculus.

Equations of straight lines and planes in three-dimensional space.

Real-valued functions of several variables. Partial derivatives and the differential of f. Taylor?s theorem. Local extreme points. Integrals of functions of several variables. Multiple integrals and their applications. Change of variables in multiple integrals. Fourier series.

UPDATE: 22.08.2018

Basic bibliography:

1. W. Żakowski, Matematyka, T.1 i T.2, WNT, Warszawa 2003.
2. M. Gewert, Z. Skoczylas, Analiza matematyczna 2 (Definicje, twierdzenia, wzory), GiS, Wrocław 2011.
3. M. Gewert, Z. Skoczylas, Analiza matematyczna 2 (Przykłady i zadania), GiS, Wrocław 2011.
4. T. Jurlewicz, Z. Skoczylas, Algebra i geometria analityczna 2, (Definicje, twierdzenia, wzory), GiS, Wrocław 2007.
5. T. Jurlewicz, Z. Skoczylas, Algebra i geometria analityczna 2, (Przykłady i zadania), GiS, Wrocław 2007.
6. I. Foltyńska, Z. Ratajczak, Z. Szafrański, Matematyka, cz. I, II, III, Wyd. Politechniki Poznańskiej, Poznań, 2001.

Additional bibliography:

1. W. Krysicki, L. Włodarski, Analiza matematyczna w zadaniach, T.1, T.2, PWN, Warszawa 2011.
2. M. Grzesiak, Liczby zespolone i algebra liniowa, Wydawnictwo PP, Poznań 1999.

Result of average student's workload

Activity	Time (working hours)
1. Lectures	36
2. Tutorials	26
3. Homeworks preparing for the tests on tutorials	30
4. Homeworks preparing for the final test on the last tutorial	20
5. Meetings with the lecturer	10
6. Homeworks preparing for the exam	30
7. Final written test on the last tutorial	2
8. Written exam	2

Student’s workload

Source of workload	hours	ECTS
Total workload	156	6
Contact hours	76	3
Practical activities	26	1