STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Mathematics		**1010314421010340025**

Field of study	Profile of study (general academic, practical)	Year /Semester
Power 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: **30**	Classes: **30**	Laboratory: **-**	Project/seminars: **-**	**5**

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 %)
technical sciences	**5 100%**
Technical sciences	**5 100%**

Responsible for subject / lecturer:

dr Jacek Gruszka
email: jacek.gruszka@put.poznan.pl
tel. 61 665 2320
Wydział Elektryczny
ul. Piotrowo 3A 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of complex numbers, matrix calculus, differentation and integration from I semester
2	**Skills**	Ability solving problems with range of complex numbers, matrix calculus, differentation and integration
3	**Social competencies**	Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills.

Assumptions and objectives of the course:

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

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 - [K_W01+++]
2. to comprehend the concept of multiple integral and know methods of calculation and applications - [K_W01+++]
3. to know types of differential equations and methods of their solving - [K_W01+++]
4. to understand the concept of The Laplace transform and know it properties and methods of calculation - [K_W01+++]

Skills:

1. to calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U06++ K_U07+++]
2. to calculate multiple and line integrals - [K_U06++ K_U07+++]
3. to recognize type of differential equation and solve it - [K_U06++ K_U07+++]
4. to apply The Laplace transform to solve linear differential equations and systems of linear differential equations with constant coefficients - [K_U06++ K_U07+++]
5. To represent functions by the Fourier - [K_U06++ K_U07+++]

Social competencies:

Assessment methods of study outcomes
Lectures: written exam checking theoretic knowledge and ability it application Classes: tests during the semester and colloquium
Course description
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.
Basic bibliography: 1. I. Foltyńska, Z.Ratajczak, Z. Szafrański, Matematyka dla studentów uczelni technicznych część 2, Wydawnictwo PP Poznan2000 2. I. Foltyńska, Z.Ratajczak, Z. Szafrański, Matematyka dla studentów uczelni technicznych część 3, Wydawnictwo PP Poznan2000,
Additional bibliography: 1. Stankiewicz W. Zadania z matematyki dla wyższych uczelni technicznych PWN Warszawa 2003

Result of average student's workload

Activity	**Time (working hours)**

Student's workload

Source of workload	**hours**	**ECTS**
Total workload	125	5
Contact hours	75	3
Practical activities	50	2