

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Mathematics		Code 1010314321010340025
Field of study Power Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 2
Elective path/specialty -	Subject offered in: polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 30 Classes: 30 Laboratory: - Project/seminars: -		No. of credits 5
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 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, differentiation and integration from I semester
2	Skills	Ability solving problems with range of complex numbers, matrix calculus, differentiation 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. Folyńska, Z.Ratajczak, Z. Szafranski, Matematyka dla studentów uczelni technicznych część 2, Wydawnictwo PP Poznan2000		
2. I. Folyńska, Z.Ratajczak, Z. Szafranski, 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