

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Mathematics I		Code 1010331211010342117
Field of study Automatic Control and Robotics	Profile of study (general academic, practical) general academic	Year /Semester 1 / 1
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 60 Classes: 30 Laboratory: - Project/seminars: -		No. of credits 8
Status of the course in the study program (Basic, major, other) basic		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 8 100% 8 100%
Responsible for subject / lecturer: dr Wiesława Nowakowska email: wieslawa.nowakowska@put.poznan.pl tel. 616652320 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge with range of secondary school.
2	Skills	Student is able to meet the challenges arising from the high school
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 variable. The getting to know applications of multiply and line integrals.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 2. To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++]		
Skills: 1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solids of revolution. - [K_U01+ K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+ K_U05+] 4. To calculate multiple and line integrals - [K_U01+ K_U05+]		
Social competencies:		
Assessment methods of study outcomes		

Lectures: written exam checking theoretic knowledge and ability it application in practical exercises.		
Classes: tests during the semester and colloquium		
Course description		
Differential and integral calculus of functions of single variable. Applications of integrals. Differential calculus of functions of several variables. Multiple integrals and their applications. Line integrals. Infinite series and power series.		
Update 2017/18. Applied methods of education:		
I Lectures		
1. Interactive lecture with questions to the group of students		
2. Discussions		
II Classes		
1. Solving illustrative tasks on board		
2. Teacher?s detailed assessment of students? solutions followed by discussion and comments		
Basic bibliography:		
1. G. Decewicz, W. Żakowski, <i>Matematyka : analiza matematyczna. Cz. 1</i> , WNT, Warszawa, 2009.		
2. W. Żakowski, M. Kołodziej, <i>Matematyka. Cz. 2, Analiza matematyczna</i> , WNT, Warszawa, 2013.		
3. I. Foltińska, Z. Ratajczak, Z. Szafranski, <i>Matematyka, cz. I, II, III</i> , Wyd. Politechniki Poznańskiej, Poznań, 2004.		
4. F. Leja, <i>Rachunek różniczkowy i całkowy</i> , PWN, Warszawa, 2008.		
Additional bibliography:		
1. Krysicki W., Włodarski L.: <i>Analiza matematyczna w zadaniach. Część I, II</i> , PWN, Warszawa, 2013.		
2. Stankiewicz W.: <i>Zadania z matematyki dla wyższych uczelni technicznych. Część I, II</i> , PWN, Warszawa, 2012.		
3. M. Gewert, Z. Skoczylas, <i>Analiza matematyczna 1 i 2</i> , Oficyna Wyd. GiS, Wrocław, 2012.		
Result of average student's workload		
Activity	Time (working hours)	
1. Lectures	60	
2. Classes	30	
3. Consultations and exam	7	
4. Preparation for classes	60	
5. Preparation for exam	33	
Student's workload		
Source of workload	hours	ECTS
Total workload	190	8
Contact hours	97	4
Practical activities	93	4