

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Mathematics</b>		Code <b>1010601111010340001</b>
Field of study <b>Mechanical Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>1 / 1</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>4</b> Classes: <b>2</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>7</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>the sciences</b> <b>Mathematical sciences</b>		ECTS distribution (number and %) <b>7 100%</b> <b>7 100%</b>
<b>Responsible for subject / lecturer:</b> dr Zdzisław Szafranski email: zdzislaw.szafranski@put.poznan.pl tel. (61) 665 26 87 Wydział Elektryczny ul. Piotrowo 3A, 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	The basic mathematics of secondary school.
2	<b>Skills</b>	Logical thinking, learning with understanding, the use of textbooks.
3	<b>Social competencies</b>	Awareness to learning and acquiring new knowledge.
<b>Assumptions and objectives of the course:</b> Getting to Know the issues of algebra and geometry, differential and integral calculus and the possibility of their application in subjects directional.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b> 1. Getting to Know the issues of algebra and geometry, differential and integral calculus and the possibility of their application in subjects directional.... - [K_W01] 2. It defines the basic concepts of mathematics concerned departments. - [K_W01]		
<b>Skills:</b> 1. Can apply calculus in physics and mechanics. - [K_U01] 2. Put using mathematical concepts to describe simple mechanical processes and issues. - [K_U01]		
<b>Social competencies:</b> 1. Understands the need for learning throughout life, can inspire others to learn. - [K_K01]		
<b>Assessment methods of study outcomes</b>		
Lecture: Assessment on the basis of written examination conducted in the examination session at the end of each of the semesters.		
Exercises: evaluation based on the current control messages in the form of written tests, tests, answers.		

<b>Course description</b>		
<p>Lectures and exercises :</p> <p>Complex numbers ( form of algebraic , trigonometric , exponential , operation, design Moivre , Euler's formulas , polynomials ) . Matrices and determinants ( action , property , Laplace theorem ) . Systems of linear equations ( Cramer's theorem , Kronecker - Capelle'go ) . The geometry of three-dimensional space ( operations on vectors and their properties, simple and plane in space) . Functions of one variable ( numerical sequences - monotonicity and limit the number of Euler , limits and continuity of functions). Differential calculus of functions of one variable ( derivative of the function - identification , interpretation , calculation , differential function and its application , the mean value theorem and its applications - extremes of function , concavity and convexity , inflection points , L'Hospital's rule , the test function). Indefinite integral ( primitive function , the sum and product integration , integration by substitution and parts , integration of rational functions ) . Definite integral (definition , interpretation and relationship to the field , property , improper integrals , applications - calculation of areas of flat fields , the arc length of the curve , volume and surface areas of solids of revolution ) . Differential calculus of functions of several variables ( differential complete and extreme and implicit function of two variables) .</p>		
<p><b>Basic bibliography:</b></p> <p>1. G. Decewicz, W. Żakowski, <i>Matematyka t. I</i>. WNT, Warszawa 2003.</p> <p>2. F. Leja, <i>Rachunek różniczkowy i całkowy</i>. Państwowe Wydawnictwo Naukowe, Warszawa 1978</p> <p>3. I. Folyńska, Z. Ratajczak, Z. Szafranski, <i>Matematyka cz. I i II</i>, Wydawnictwo Politechniki Poznańskiej, Poznań 2001.</p>		
<p><b>Additional bibliography:</b></p> <p>1. M. Gewert, Z. Skoczylas, <i>Analiza matematyczna 1</i>, Oficyna Wydawnicza GiS, Wrocław 2006.</p> <p>2. H. Jurlewicz, Z. Skoczylas, <i>Algebra liniowa 1</i>, Oficyna Wydawnicza GiS, Wrocław 2006.</p> <p>3. W. Kryszicki, L. Włodarski, <i>Analiza matematyczna w zadaniach, t. I</i>, PWN, Warszawa 2006.</p>		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	220	7
Contact hours	90	0
Practical activities	30	0