

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Mathematics		Code 1010604111010340001
Field of study Mechanical Engineering	Profile of study (general academic, practical) (brak)	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) part-time	
No. of hours Lecture: 36 Classes: 20 Laboratory: - Project/seminars: -		No. of credits 7
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 %) 7 100%
Responsible for subject / lecturer: dr Zdzisław Szafranski email: zdzislaw.szafranski@put.poznan.pl tel. (61) 665 26 87 Wydział Elektryczny ul. Piotrowo 3A, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	The basic mathematics of secondary school.
2	Skills	Logical thinking, learning with understanding, the use of textbooks.
3	Social competencies	Awareness to learning and acquiring new knowledge.
Assumptions and objectives of the course: Getting to Know the issues of algebra and geometry, differential and integral calculus and the possibility of their application in subjects directional.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
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]		
Skills:		
1. Can apply calculus in physics and mechanics. - [K_U01]		
2. Put using mathematical concepts to describe simple mechanical processes and issues. - [K_U01]		
Social competencies:		
1. Understands the need for learning throughout life, can inspire others to learn. - [K_K01]		
Assessment methods of study outcomes		
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.		
Course description		

<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>Basic bibliography:</p> <p>1. G. Decewicz, W. Żakowski, Matematyka t. I. WNT, Warszawa 2003. 2. F. Leja, Rachunek różniczkowy i całkowy. Państwowe Wydawnictwo Naukowe, Warszawa 1978 3. I. Folyńska, Z. Ratajczak, Z. Szafranski, Matematyka cz. I i II, Wydawnictwo Politechniki Poznańskiej, Poznań 2001.</p>		
<p>Additional bibliography:</p> <p>1. M. Gewert, Z. Skoczylas, Analiza matematyczna 1, Oficyna Wydawnicza GiS, Wrocław 2006. 2. H. Jurlewicz, Z. Skoczylas, Algebra liniowa 1, Oficyna Wydawnicza GiS, Wrocław 2006. 3. W. Kryszcki, L. Włodarski, Analiza matematyczna w zadaniach, t. I, PWN, Warszawa 2006.</p>		
<p>Result of average student's workload</p>		
<p>Activity</p>		<p>Time (working hours)</p>
<p>Student's workload</p>		
<p>Source of workload</p>	<p>hours</p>	<p>ECTS</p>
Total workload	220	7
Contact hours	90	0
Practical activities	30	0