

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Mathematics</b>		Code <b>1010101211010340004</b>
Field of study <b>Environmental Engineering First-cycle Studies</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>45</b> Classes: <b>30</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>6</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		ECTS distribution (number and %)
<b>Responsible for subject / lecturer:</b>  Małgorzata Zbąszyniak email: -malgorzata.zbaszyniak@put.poznan.pl tel. -66552330 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge with range of secondary school.
2	<b>Skills</b>	The ability to associate facts, information processing, reasoning, interpretation and ability to reflect.
3	<b>Social competencies</b>	Student understands the need and knows the possibility of studying, improving language skills, professional, personal and social skills.
<b>Assumptions and objectives of the course:</b> -The recognizing methods and applications of mathematical analysis and linear algebra.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. The student explains the basic mathematical laws and explains conditions for their application. - [K_W02]		
2. The student knows rules for finding derivative, indefinite and definite integrals and their applications. - [K_W01]		
<b>Skills:</b>		
1. The student uses the literature and also other sources of knowledge. - [K_U01]		
2. The student uses calculus in calculations resulting from the needs of engineering practice. - [K_U10]		
3. The student formulates simple conclusions on the basis of results. - [K_U01]		
<b>Social competencies:</b>		
1. The sense of usefulness of mathematical competence in engineering practice. - [K_K01]		
2. The ability to work in a team. - [K_K03]		
<b>Assessment methods of study outcomes</b>		

<p>LECTURE.A two-part written examination at the end of the semestr:          -sat.1 theoretic knowledge (30%);          -sat.2 applications in practical exercises (70%).          Duration of test: 90 minutes.</p> <p>Classes: tests during the semestr (5x30 minutes).</p>		
<b>Course description</b>		
<p>-Complex numbers.          -Elementary function and sequences of numbers.          -Differential and integral calculus.De L'Hospital rule. Trigonometric and rational integrals, partial fractions and quadratic expressions, miscellaneous substitutions. Areas, lengths of curves, the area and the volume of the surface of revolution obtained by revolving C about the x-axis. Mas, moments <math>M_x</math> and <math>M_y</math> and the center of mass. Integrals with infinite limits of integration.          -Functions of several variables. Partial derivatives, differentials,extrema of functions of several variables.          -Matrices end determinants, systems of linear equations.</p>		
<b>Basic bibliography:</b>		
<p>1. W. Stankiewicz, J. Wojtowicz, Zadania z matematyki dla wyższych uczelni technicznych, PWN, część pierwsza i druga, Warszawa.          2. M. Gewert, Z.Skoczylas, Analiza matematyczna 1. Definicje, twierdzenia, wzory. Oficyna Wydawnicza GiS.          3. I. Folyńska, Z. Ratajczak, Z. Szafranski, Matematyka część I i II, Wydawnictwo Politechniki Poznańskiej.          4. W. Stankiewicz, J. Wojtowicz, Zadania z matematyki dla wyższych uczelni technicznych, PWN, część pierwsza i druga, Warszawa.          5. M. Gewert, Z.Skoczylas, Analiza matematyczna 1. Definicje, twierdzenia, wzory. Oficyna Wydawnicza GiS.          6. I. Folyńska, Z. Ratajczak, Z. Szafranski, Matematyka część I i II, Wydawnictwo Politechniki Poznańskiej.</p>		
<b>Additional bibliography:</b>		
<p>1. E. Swokowski, Calculus with analytic geometry, Prindle, Weber &amp; Schmidt, Boston, Massachusetts.          2. W. Krywicki, L.Włodarski,Analiza matematyczna w zadaniach, PWN, Warszawa.          3. E. Swokowski, Calculus with analytic geometry, Prindle, Weber &amp; Schmidt, Boston, Massachusetts.          4. W. Krywicki, L.Włodarski,Analiza matematyczna w zadaniach, PWN, Warszawa.</p>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Share in lectures	45	
2. Share in classes	30	
3. Preparing for classes and for written tests	60	
4. Preparing for examination	35	
5. Share in consultations. Examination period	10	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	180	6
Contact hours	85	4
Practical activities	0	0