



Subject card

Subject name and code	Mathematics III, PG_00039778						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2021/2022		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			7.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Mathematics Center -> Vice-Rector for Education						
Name and surname of lecturer (lecturers)	Subject supervisor	dr Anna Niewulis					
	Teachers	mgr Katarzyna Kiepiela dr Anna Niewulis					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	45.0	30.0	0.0	0.0	0.0	75
	E-learning hours included: 0.0 Adresy na platformie eNauczanie:						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM		
	Number of study hours	75	15.0	85.0	175		
Subject objectives	The aim of this subject is to obtain the students competence in the range of using the basic methods of mathematical analysis. Furthermore, the student is able to use this knowledge to solve simple theoretical and practical problems that can be found in the field of engineering.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_K01	Student recognizes the importance of self-expanding knowledge and takes the challenge of working with a group to solve a problem.			[SK1] Assessment of group work skills [SK2] Assessment of progress of work		
	K6_U05	Student is able to process the acquired information, analyze and interpret it, draw conclusions and reason opinions.			[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	K6_W01	Student uses methods of mathematical description of phenomena in the physical / mechanical / chemical processes.			[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		

Subject contents	<p>Functions of two variables:</p> <p>Limit and continuity of a function of several variables. Partial derivatives. Total differential. Taylors formula. Maxima and minima of a function of several variables. Double integrals over rectangles and normal domains. Two dimensional change of variables theorem. Applications of double integrals.</p> <p>Ordinary differential equations:</p> <p>First order differential equations. General and particular solution. The Cauchy initial value problem. Variables separable, linear, Bernoulli, exact differential equations. Second order linear differential equations with constant coefficients. Fundamental set of solution of the homogeneous linear differential equation. Higher order linear differential equations with constant coefficients.</p> <p>Number series :</p> <p>Number series. Convergent and divergent series. Convergence tests of the number series.</p>											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="448 985 796 1025">Subject passing criteria</th> <th data-bbox="796 985 1142 1025">Passing threshold</th> <th data-bbox="1142 985 1485 1025">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1025 796 1057">Exam</td> <td data-bbox="796 1025 1142 1057">50.0%</td> <td data-bbox="1142 1025 1485 1057">50.0%</td> </tr> <tr> <td data-bbox="448 1057 796 1093">Midterm colloquium</td> <td data-bbox="796 1057 1142 1093">50.0%</td> <td data-bbox="1142 1057 1485 1093">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Exam	50.0%	50.0%	Midterm colloquium	50.0%	50.0%
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Midterm colloquium	50.0%	50.0%										
Recommended reading	Basic literature	<p>G.M. Fichtenholz "Rachunek różniczkowy i całkowy" tom I, II, III</p> <p>M. Grabowski "Analiza matematyczna" Powtórzenie, ćwiczenia i zbiór zadań, WNT, Warszawa 1997</p> <p>R.Leitner, W. Matuszewski, Z. Rojek "Zadania z matematyki wyższej"</p> <p>K. Dobrowolska "Matematyka dla studiów technicznych dla pracujących" tom I,II, PWN , Warszawa 1981,</p> <p>L. Siewierski "Ćwiczenia z analizy matematycznej z zastosowaniami" tom I, II, PWN, Warszawa 1982,</p> <p>W. Krysicki, L. Włodarski "Analiza matematyczna w zadaniach" cz. I, II, PWN, Warszawa 1986,</p> <p>W. Stankiewicz "Zadania z matematyki dla wyższych uczelni technicznych" część I, II, PWN, Warszawa 1980,</p> <p>M. Lassak "Zadania z analizy matematycznej"</p>										

	Supplementary literature	<p>K. Jankowska, T. Jankowski "Zbiór zadań z matematyki wyższej", Wyd. PG, Gdańsk 1999,</p> <p>K. Jankowska, T.J ankowski "Funkcje wielu zmiennych Całki wielokrotne Geometria analityczna", Wyd. PG, Gdańsk 2005</p> <p>B. Gdowski, E. Pluciński "Zadania z rachunku wektorowego i geometrii analitycznej", PWN, Warszawa 1982</p> <p>I. Dziubiński, L. Siewierski Matematyka dla wyższych szkół technicznych , PWN, Warszawa 1984,</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>Give the definition of the sum of the series.</p> <p>Compute the sum of the given series with general term a_n.</p> <p>Check whether the given series is convergent using the ratio test, the root test.. the comparison test or the integral test.</p> <p>Compute partial differentials of the second order for the given function $f(x,y)$.</p> <p>Find extreme values of the function $f(x,y)$.</p> <p>Compute the double integral of the given function $f(x,y)$ over the region D .</p> <p>Find the total differential of the function f.</p> <p>Find the equation of the plane tangent to the surface S at the point P.</p> <p>Find the general solution of the differential equation..</p> <p>Find a particular solution of the differential equation ... satisfying the given initial conditions .</p> <p>Find the general solution of the differential equation . by the method of variation of parameters .</p>	
Work placement	Not applicable	

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