GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics II, PG_00050185		
Field of study	Engineering Management		
Date of commencement of studies	October 2019	Academic year of realisation of subject	2019/2020
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	5.0
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 Stanisław Domachowski	
	Teachers	dr Stanisław Domachowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	16.0	16.0	0.0	0.0	0.0	32

E-learning hours included: 0.0

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	32	7.0	86.0	125

Subject objectives

The aim of this subject is to obtain the student's competence in the range of using the basic methods of mathematical analysis and linear algebra.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_W11] has the basic knowledge of mathematics, physics and chemistry necessary to solve technical problems	Student defines basic notions of matrix calculus. Student uses basic notions and formulas of matrix calculus in solving systems of linear equations. Student analisies properties of a given function of two variables using differentional calculus of several variables functions. Student demonstrates some chosen techniques of solving ordinary differential equations and difference equations.	[SW1] Assessment of factual knowledge
[K6_U01] interprets and analyses the phenomena and processes taking place in the economy and organisation using basic theoretical knowledge of economics, management and science	Student defines basic notions of matrix calculus. Student uses basic notions and formulas of matrix calculus in solving systems of linear equations. Student analisies properties of a given function of two variables using differentional calculus of several variables functions. Student demonstrates some chosen techniques of solving ordinary differential equations and difference equations.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information

Subject contents

Integral calculus of one variable functions – antiderivatives, Definite integrals. Complex numbers - basic informations. Elements of linear algebra: Matrices, their properties and operations on matrices. Determinants. Inverse of a square non-singular matrix. Systems of linear equations and inequalities. Eigenvectors and eigenvalues. Functions of two variables: Partial derivatives. Total differential. Maxima and minima of a function of several variables. Ordinary differential equations: First order differential equations. General and particular solution. Second order linear differential equations with constant coefficients. Fundamental set of solution of the homogeneous linear differential equation.

<table>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Midterm colloquium</td><td>50.0%</td><td>40.0%</td></tr>
<tr><td>Class activity, homeworks</td><td>0.0%</td><td>10.0%</td></tr>
<tr><td>Written exam</td><td>50.0%</td><td>50.0%</td></tr>
</table>
</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>M. Gewert, Z. Skoczylas : Analiza matematyczna 2, Oficyna Wydawnicza GiS M. Gewert, Z. Skoczylas, Algebra liniowa 1, Oficyna wydawnicza GiS, Wrocław, K. Jankowska, T. Jankowski : Zadania z matematyki wyższej, Wydawnictwo PG K. Jankowska, T. Jankowski, Funkcje wielu zmiennych - Całki wielokrotne - Geometria analityczna, Wydawnictwo PG, K. Jankowska, T. Jankowski, Zadania z matematyki wyższej. Wydawnictwo PG E. Mieloszyk, Liczby zespolone, Wydawnictwo PG, E. Mieloszyk, Macierze, wyznaczniki i układy równań, Wydawnictwo PG</td></tr>
<tr><td>Supplementary literature</td><td>W. Krysicki, L. Włodarski : Analiza matematyczna w zadaniach II, Wydawnictwo Naukowe PWN R. Leitner, Zarys matematyki wyższej II, Wydawnictwo Naukowo-Techniczne Praca zbiorowa pod red. E. Mieloszyka : Matematyka – Materiały pomocnicze do ćwiczeń, Wydawnictwo PG W. Stankiewicz : Zadania z matematyki dla wyższych uczelni technicznych, Wydawnictwo Naukowe PWN</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Find extreme values of the function f(x,y).

2. Discuss the existence of the solution for the given system of linear equations.

3. Find the rank of the matrix.

4. Find the total differential of the function f.

5. Find a particular solution of the differential equation ... satisfying the given initial conditions ….</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
</table>