GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics II, PG_00039864
Field of study	Mechanical Engineering, Mechanical Engineering

Date of commencement of studies	October 2020	Academic year of realisation of subject	2020/2021
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	6.0
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 mgr Mirosław Bednarczyk / dr Stanisław Domachowski

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie: WIMiO - MiBM - MATEMATYKA II 2020/21 (S.Domachowski) - Moodle ID: 13410 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13410 WIMiO - MiBM - MATEMATYKA II 2020/21 (S.Domachowski) - Moodle ID: 13410 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13410						

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	60	5.0	85.0	150

Subject objectives	The aim of the subject is to obtain the student's competence in the use of the basic apparatus of mathematical analysis and linear algebra and the application of the acquired knowledge to solve simple theoretical and practical problems occurring in engineering fields.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U01] is able to acquire information from specialized literary sources, databases and other resources, essential for solving engineering tasks; is able to compile the obtained information pieces and to interpret them, additionally is able to form conclusions and present justified opinion		
	[K6_W01] possesses mathematical knowledge within the range of linear algebra and mathematical analysis useful in characterising and interpreting mechanical systems, technological processes and operational properties of devices	Student analyses analitycal geometry problems. Student examines functions of several variables, using the concept of a limit, continuity and derivatives . Student calculates double and triple integrals and explains the method of substitution in these integrals. Student uses double and triple integrals in geometrical problems.	[SW1] Assessment of factual knowledge

Subject contents	Integration of irrational functions of second degree. Integration of trigonometric functions. Definite integrals. Geometric application of definite integrals. Improper integrals. Complex numbers. Matrices, system of linear equations. Vectors in three- dimensional space. The dot , and the cross product of vectors, their properties and applications. The scalar triple product of vectors, and its applications. Equations of a line and a plane in a space. Distance from a point to a plane. Angles between planes and lines. Limits and continuity of a function of several variables, partial derivatives, total differentia, extrema of functions of several variables, implicit functions. Double integral over a rectangle, and the normal domain, change of variables in a double integral. Applications of the double integral.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final exam, 3 tests, active participation during classes	50.0%	100.0%
Recommended reading	Basic literature	„Zadania z matematyki dla wyższych uczelni technicznych", PWN, Warszawa 1980,K.Jankowska, T.Jankowski, Zbiór zadań z matematyki, Wydawnictwo Politechniki Gdańskiej Gdańsk 2003, K.Jankowska, T.Jankowski, Funkcje wielu zmiennych, całki wielokrotne, geometria analityczna, Wydawnictwo Politechniki Gdańskiej Gdańsk 2006, G.Kwiecińska, Matematyka część III Analiza funkcji wielu zmiennych.Wydawnictwo UG.M.Gewert, Z.Skoczylas, analiza matematyczna 2, Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS Wrocław 2004, M.Gewert, Z.Skoczylas, analiza matematyczna 2, Przykłady i zadania, Oficyna Wydawnicza GiS Wrocław 2004, T.Jurlewicz, Z.Skoczylas, Algebra liniowa, Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS Wrocław 2004, T.Jurlewicz, Z.Skoczylas, Algebra liniowa,Przykłady i zadania, Oficyna Wydawnicza GiS Wrocław 2004, J.Dymkowska, D. Beger „Rachunek całkowy w zadaniach" Wydawnictwo Politechniki Gdańskiej Gdańsk 2015, J.Dymkowska, D. Beger „Rachunek różniczkowy w zadaniach" Wydawnictwo Politechniki Gdańskiej Gdańsk 2015,	
	Supplementary literature	T. Jankowski „Matematyka. Podręcznik dla wydziałów elektrycznych i mechanicznych politechnik", PWN, Warszawa 1967 W. Leksiński, I. Nabiałek, W. Żakowski „Matematyka. Definicje, twierdzenia, przykłady, zadania"-podręczniki akademickie , Wyd. NT, Warszawa 1994, K.Dobrowolska, praca zbiorowa „Matematyka dla studiów technicznych dla pracujących" Tom I, PWN, Warszawa 1981, R. Grzymkowski „Matematyka, zadania i odpowiedzi", podręczniki akademickie, Wyd. Pracowni Komputerowej Jacka Skalmierskiego, Gliwice 2002 , M. Lassak „Zadania z analizy matematycznej", Wyd. Wspierania Procesu Edukacji, Warszawa 2003	
	eResources addresses	WIMiO - MiBM - MATEMATYKA II 2020/21 (S.Domachowski) - Moodle ID: 13410 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13410	
		WIMiO - MiBM - MATEMATYKA II 2020/21 (S.Domachowski) - Moodle ID: 13410 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13410	
Example issues/ example questions/ tasks being completed	1. Evaluate indefinite integral. 2. Find the local extreme values of the function f(x,y)=x/(y+1)+8/x-y-1. 3. Compute the double integral of the given function f(x,y) over the region D. 4. Find the equation of the plane tangent to the surface S at the point P. 5. Show that the points A, B, C, D do not lie on the plane. 6. Discuss the relative position of the line l and the plane S.		
Work placement	Not applicable		