GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics II, PG_00024116		
Field of study	Electrical Engineering		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	8.0
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 mgr Justyna Woroń dr Anna Niewulis	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	45.0	60.0	0.0	0.0	0.0	105

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	105	10.0	85.0	200

Subject objectives

Students obtain competence in the range of using methods of mathematical analysis and ordinary differential equations and knowledge how to solve simple problems that can be found in the field of engineering.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_K02	Student is able to work individually and in a group, knows how to estimate the time needed to carry out the task, and is able to implement the work schedule.	[SK1] Assessment of group work skills [SK3] Assessment of ability to organize work
K6_W01	Student tests canvergence of number series. Student uses power series in order to compute sums of number series. Student determines a Fourier series of a given functions. Student analyses properties of a given function of two variables using differentional calculus of several variables functions. Students calculates double integrals, and explains the metod of substitution of variables in the double integral. Student applies double integrals to solve geometrical problems. Student demonstrates some techniques of solving ordinary differential equations.	[SW1] Assessment of factual knowledge
K6_U01	Student is able to process the acquired information, analyze and interpret it, draw conclusions and reason opinions. Student understands the need of lifelong learning and improving their engineering knowledge	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information

Subject contents

Course content – lecture
Numerical and functional series: concept of a series, convergence and divergence, convergence tests, domain of convergence

Power series: definition, radius and interval of convergence, function expansions into Taylor and Maclaurin series, differentiation and integration of power series, applications in approximate calculations

Trigonometric series: Fourier series, sine series and cosine series

Functions of several variables: domain, partial derivatives, total differential, directional derivative and gradient, local extrema, implicit functions

Double integrals: definition, integration over rectangular and normal regions, change of variables, polar coordinates, applications

Ordinary differential equations: first-order equations, general and particular solutions, initial value problems (Cauchy problem), separable equations, linear equations and Bernoulli equations, second-order linear equations with constant coefficients

---

Course content – exercises
Testing convergence and applying convergence criteria for numerical series

Finding the radius and interval of convergence of power series, expanding functions into series, operations on power series

Determining coefficients of the Fourier series and expanding functions into trigonometric series

Computing partial derivatives, total differentials, directional derivatives and gradients, finding local extrema

Computing double integrals, change of variables, geometric and physical applications

Solving first-order differential equations, second-order linear equations, and initial value problems

---

Prerequisites and co-requisites

Knowledge of the subject: Mathematics I.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Midterm colloquium	50.0%	50.0%
Written exam	50.0%	50.0%

Recommended reading

Basic literature

Gewert M., Skoczylas Z "Analiza matematyczna 2." Wrocław: GiS, 2004.
Gewert M., Skoczylas Z "Równania różniczkowe zwyczajne" Wrocław: GiS, 2004.
Jurewicz T., Skoczylas Z. "Algebra liniowa 2." Wrocław: GiS, 2004.
Krysicki W., Włodarski L. "Analiza matematyczna w zadaniach, cz. I i II." Warszaw: PWN, 2006.

Supplementary literature

Lassak M. "Matematyka dla studiów technicznych." Warszawa: Supremum, 2004.
Leksiński W., Nabiałek I., Żakowski W. "Matematyka. Definicje, twierdzenia, przykłady, zadania." warszawa: WNT. 2003.

eResources addresses

Example issues/ example questions/ tasks being completed	Give the definition of the sum of the series. Check whether the given series is convergent using the ratio test, the root test.. the comparison test or the integral test. Compute partial differentials of the second order for the given function f(x,y). Find extreme values of the function f(x,y). Compute the double integral of the given function f(x,y) over the region D. Find a particular solution of the differential equation ... satisfying the given initial conditions . Find the general solution of the differential equation . by the method of variation of parameters.
Practical activites within the subject	Not applicable

Document generated electronically. Does not require a seal or signature.