Calculus

Course description

Basic information

Field of study : Analytical Computer Science

Path : -

Organizational unit : Faculty of Mathematics and Computer Science

Education level : first-cycle

Form of study : full-time studies

Study profile : general academic

Mandatory status : compulsory

Education cycle : 2022/23

Course code : UJ.WMIIANS.110.02906.22

Language of instruction : Polish

Disciplines : Mathematics

ISCED classification : 0541 Mathematics

USOS code : WMI.TCS.AM1.OL

Course coordinator

Rafał Pierzchała

Course instructor

Rafał Pierzchała

Period Semester 1	Form of verification of learning outcomes graded credit Teaching format and hours lecture: 30 tutorials: 30	Number of ECTS credits 5.0

Learning outcomes for the course

Code	Outcomes in terms of	Directional learning outcomes	Verification methods

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Knowledge – The student knows and understands:			
W1	theorems covered in the lecture, listed in the Syllabus Content field	IAN_K1_W01, IAN_K1_W12	graded credit
Skills – The student can:			
U1	provide examples of applications of theorems learned during the lecture and solve typical problems related to these theorems	IAN_K1_U02	graded credit
Social competences – The student is ready to:			
K1	precisely formulate questions for the analysis of a given topic	IAN_K1_K01	no credit

ECTS credits balance

Student activity form	Average number of hours* dedicated to completed activity types	
lecture	30	
tutorials	30	
preparation for classes	90	
Total student workload	Number of hours 150	ECTS 5.0

* hour (lesson) means 45 minutes

Course content

No.	Program content	Learning outcomes for the course

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1.	Introductory information. Sequences and series. Properties of convergent sequences. Numerical series. Convergence criteria for series. Limits and continuity. Function limit. One-sided limits. Theorems on the relationship between limits and operations. Continuous functions and their properties. Differential calculus of functions of one variable. Definition of derivative. Theorems on differentiation of sum, product, quotient, composition, and inverse function. Rolle's and Lagrange's theorems. L'Hospital's rules. Derivatives of orders higher than 1. Taylor's formula. Investigating function properties. Integral calculus of functions of one variable. Theorems on integration by parts and integration by substitution.	W1, U1, K1

Extended information

Teaching methods:

conventional lecture, subject tutorials

Class type	Credit forms	Course credit conditions
lecture	no credit	Positive grade from tutorials.
tutorials	graded credit	Oral or written tests. Problems to solve independently. Activity during classes.

Prerequisites and additional requirements

attendance at tutorials is mandatory

Literature

Required

1. F. Leja, Rachunek różniczkowy i całkowy, Państwowe Wydawnictwo Naukowe, Warszawa 1969.
2. W. Rudin, Podstawy analizy matematycznej, Państwowe Wydawnictwo Naukowe, Warszawa 1982.
3. G.M. Fichtenholz, Rachunek różniczkowy i całkowy (tomy I i II), PWN Warszawa 1995.
4. W. Krysicki, L. Włodarski, Analiza matematyczna w zadaniach, część I, Wydawnictwo Naukowe PWN, Warszawa 2006.