


KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez
Unię Europejską w ramach
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Społecznego

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY


Course title			ECTS code		
Mathematics			7.2.0592		
Name of unit administrating study					
null					
Studies					
faculty		field of study		type	
Wydział Chemii		Ochrona środowiska		pierwszego stopnia	
				form	
				specjalty	
				specialization	
				stacjonarne	
				Podstawowa	
				Podstawowa	
Teaching staff					
dr Aleksandra Grzegorek; dr Maciej Niebrzydowski; Marta Leśniak; dr Krzysztof Topolski; dr hab. Rafał Filipów; dr Danuta Jaruszewska-Walczak; dr Elżbieta Mrozek; prof. UG, dr hab. Błażej Szepietowski; prof. UG, dr hab. Witold Rosicki; dr Jerzy Popko; mgr Piotr Michalak; dr Marek Hałenda; mgr inż. Mateusz Gałka; mgr Rafał Perczyński; dr Piotr Karwasz; mgr Krzysztof Kowitz; dr Michał Jabłonowski; dr Iwona Krzyżanowska					
Forms of classes, the realization and number of hours				ECTS credits	
Forms of classes				8	
Auditorium classes, Lecture				classes - 75 h	
The realization of activities				tutorial classes - 45 h	
classroom instruction				student's own work - 80 h	
Number of hours				TOTAL: 200 h - 8 ECTS	
Lecture: 30 hours, Auditorium classes: 45 hours					
The academic cycle					
2022/2023 winter semester					
Type of course			Language of instruction		
obligatory			polish		
Teaching methods			Form and method of assessment and basic criteria for eveluation or examination requirements		
problem solving			Final evaluation		
			- Graded credit		
			- Examination		
			Assessment methods		
			- written exam with open questions		
			- (mid-term / end-term) test		
			The basic criteria for evaluation		
			Results of exam and tests. Activity during classes.		
Method of verifying required learning outcomes					
Required courses and introductory requirements					
A. Formal requirements					
none					
B. Prerequisites					
Aims of education					
Aims of education					
Introduction of elementary definitions in differential and integral calculus and linear algebra;					
acquiring the ability to solve basic problems in this field					

Course contents

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Limits, continuous functions. Closed, open and connected sets. Weierstrass theorem and Darboux theorem. Derivatives and differential. Interpretations: velocity, acceleration, tangential, elasticity. Monotonicity, d'Hospital principle, Taylor formula, approximations. Local and global extrema, minimum and maximum of real functions on closed intervals. Indefinite and definite integrals, geometric interpretation. Differential calculus of multivariable functions. Gradient, Jacobian matrices, Hessian. directional derivatives. Local extrema, conditional extrema.

Complex numbers. Vector space, basis, linear mappings, multilinear mappings. Matrices, determinants, range, Kronecker-Capelli theorem, method of Gauss elimination. Determinacy, Sylvester criterion.

Bibliography of literature

Bibliography of literature

Literature required to pass the course

R. Kowalczyk, K. Niedziałomski, C. Obczyński, Matematyka dla studentów i kandydatów na wyższe uczelnie. Repetytorium, PWN.

R. Kowalczyk, K. Niedziałomski, C. Obczyński, Granice i pochodne. Metody rozwiązywania zadań, PWN.

R. Kowalczyk, K. Niedziałomski, C. Obczyński, Całki. Metody rozwiązywania zadań, PWN.

P. Kajetanowicz, J. Wierzejewski, Algebra z geometrią analityczną, PWN.

W. Kryszewski, L. Włodarski, Analiza matematyczna w zadaniach. Część 1, PWN.

Extracurricular readings

The learning outcomes (for the field of study and specialization)

Knowledge

Skills

Social competence

Contact

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