

Description of an Individual Course Unit

Study program		All, except Chemistry	
Module			
Type and level of studies		PhD studies	
Course title		Selected topics in mathematical analysis	
Professor (for lectures)		Boban Marinkovic	
Professor/assistant (for practice)			
Professor/assistant (for LAB)			
Number of ECTS		5	Type of the course (mandatory/elective) elective
Prerequisite	Credits from courses equivalent to Mathematics I and Mathematics II		
Objective of the course	The goal of this course is to teach students basic concepts and theoroms from the following areas: Complex functions of complex variables, Calculus of variations, Series Fourier		
Learning outcomes of the course	This course provides knowledge that can be applied to other natural science and technical-technological courses taught in the department. The course is intended to enable students to successfully apply the acquired mathematical knowledge in solving techical and technological problems.		
Course Contents			
Theoretical contents	Complex functions of complex variable-definition, complex sequences, limit and conitnuity, derivative and differentiability, Cauchy-Riemann equations, integration, Cauchy’s integral formulas, Taylor's and Loran's sereies, residues and residue theorem. ; Calculus of variations-unconstrained and constarined minimum of functions of several variables, basic problem of the calculus of variations, problems with high order derivatives Series Fourier-ortogonality of trigonometric functions, Dirichle theorem, seriees Fourier of some functions ; Solving examples and tasks that illustrate various concepts presented in the theoretical contens as well as their mutual relations. Moreover, the practical examples give an opportunity to exercise applying acquired theoretical knowledge to problems of natural and technical-technological sciences. ;		
Practical part (practices, LAB, study research work)			
Literature			
1	D. Zill, P. Shanahan, A first course in complex analysis, Jones and Bartlett Publishers, Inc., London, 2003		
2	B. Brunt, Calculus of variations, Springer, New York, 2004		
3			
4			
5			
Lessons per week			
Lectures	Practices	LAB	Study research work Other activities
2			
Teaching Methods	Lectures		
Grading methods (max. number of points is 100)			
Pre-exam assesments	points	Final examination	points
activity during lectures		written exam	
practical assesments		oral exam	60
mid-term exams	40		
seminars			