

Level: bachelor				
Course title: Analysis 1				
Status: obligatory				
ECTS: 9				
Requirements: none				
Learning objectives Acquiring basic knowledge and skills in mathematical analysis of real functions of one real variable.				
Learning outcomes Obtaining the basic knowledge on the notions from mathematical analysis and preparation for further courses in mathematical analysis.				
Syllabus <i>Theoretical instruction</i> Axiomatic approach to the field of real numbers. Convergent sequences of real numbers. Limits of real valued functions. Continuous functions and their local properties and global properties on closed intervals. Differentiable functions (the relation to algebraic operations, composite function, inverse function). The criteria of monotonicity and extreme values. Higher derivatives and Taylor formula. Examination of real functions. Integral (changing the variable and partial integration). Integrals of rational functions. The Riemann integral and its applications on surface area, volumes and curve length. Numerical series, criteria for absolute convergence (D’Alambert and Cauchy). Series of functions (general and power) and their relation to convergence, derivation and integration. Improper integral. <i>Practical instruction</i> Proving some properties of real numbers based on the axiomatic. Basic properties of elementary functions. Calculation of the limits of sequences and functions. Derivatives of elementary functions. Application of criteria for finding the extreme values of functions. Application of Taylor formula for approximation of function values. Calculation of indefinite and definite integrals. Application of definite integral. Application of convergences criteria of numerical and functional series. Application of criteria for the convergence of improper integrals.				
Weekly teaching load				Other: 0
Lectures: 3	Exercises: 3	Other forms of teaching: 0	Student research: 0	