

SUBJECT: **Mathematics**

HOURS: 30h(lectures)+30h(classes) ECTS: 6

Name/title of the author:	
Course Description:	The course includes a symbolic and numeric approach to algebra of matrices, determinants, systems of simultaneous linear equations, a development of the fundamental concepts of calculus using numerical and analytic methods with algebraic and trigonometric functions of a single variable. The course is focused also on applications of this formal apparatus to practical economic problems.
Learning Outcomes (Goals and Objectives of the course):	To provide students with basic concepts and techniques of intermediate linear algebra as well as ones of calculus and applications to the simple economical models and investigation. To transfer knowledge and skills in linear algebra and mathematical analysis and their applications to the simple economic models and investigation. To develop the ability to abstract thinking and to drawing of logical conclusions.
Entrance qualifications:	Knowledge and skills from standard school mathematics, in particular: <ul style="list-style-type: none">• arithmetic operations and algebraic manipulations,• graphs and properties of elementary functions (linear, quadratic, polynomials, rational, logarithmic, exponential, trigonometric),• solving of elementary equations and inequalities.
Course Content:	Linear algebra: Algebra of matrices; Systems of linear equations, Input – output analysis Analysis: Functions of one variable (limits, derivatives, asymptotes, increase and decrease, relative maxima and minima, concavity and second derivative); Economical applications of derivatives; Functions of Two Variables (domain; partial derivatives; relative maxima and minima); Integral Calculus (antiderivatives and indefinite integrals; definite integrals; improper integrals); Applications of the definite integral in geometry
Assessment policy (examination):	Of the course: final exam (written, descriptive). Of problem sessions (classes): mid-term tests.
Course materials/bibliography:	<ol style="list-style-type: none">1. Handouts and additional readings delivered by lecturer2. B. Ciałowicz - Workouts in Calculus and Linear Algebra with Applications to Economics, Krakow, 20173. Carl P. Simon, Lawrence Blume, <i>Mathematics for Economists</i>, W. W. Norton and Company, New York, 19944. Vassilis C. Mavron, Timothy N. Phillips, <i>Elements of Mathematics for Economics and Finance</i>, Springer-Verlag, London, 2007
Methods of Instruction:	Lectures, presentations, blackboard problem solving, e-learning, effort in class.