

Tárgytematika / Course Description
Mathematics 1 for Economists**GKNB_MSTA012****Tárgyfelelős neve /****Teacher's name:** Pestiné dr. Rácz Éva Veronika**Félév / Semester:** 2025/26/1**Beszámolási forma /****Assesment:** Vizsga**Tárgy heti óraszám /****Teaching hours(week):** 2/2/0**Tárgy féléves óraszám /****Teaching hours(sem.):** 0/0/0**OKTATÁS CÉLJA / AIM OF THE COURSE**

Mathematics is essential for understanding economics, financial calculations and predictions. Mathematics 1 and 2 for Economists provide all the basic mathematical background economist students need for they technical courses. In the first semester, the course offers a thorough review, reinforcement, and extension of secondary school mathematics essential for foundational studies in economics and health sciences. This is followed by the introduction to elementary function theory and the fundamentals of differential calculus, with an emphasis on practical applications.

TANTÁRGY TARTALMA / DESCRIPTION**Témakör név: Basic calculations**

Témakör leírása: Operations on expressions: polynomials, rational expressions Linear and quadratic equations
Témakör kulcsszavai: exponents, polynomials, simplification, balance method

Témakör név: Systems of equations, inequalities

Témakör leírása: Systems of equations: linear and quadratic Inequalities: linear, quadratic, and rational inequalities Systems of inequalities

Témakör kulcsszavai: system of equation, inequality

Témakör név: Functions

Témakör leírása: square root functions, absolute value functions, rational functions, exponential and logarithmic functions

Témakör kulcsszavai: square root function, absolute value, logarithm

Témakör név: Exponential equations

Témakör leírása: the concept of logarithm; logarithmic equations and inequalities

Témakör kulcsszavai: exponential equation, logarithmic equation

Témakör név: Arithmetic and geometric sequences

Témakör leírása: Calculation and use of arithmetic and geometric sequences

Témakör kulcsszavai: arithmetic sequence, geometric sequence

Témakör név: Curve fitting

Témakör leírása: Fitting a line through two points; fitting a parabola through three points Interpreting linear and quadratic functions from their graphs

Témakör kulcsszavai: Curve fitting, line, parabola

Témakör név: Differential calculus

Témakör leírása: Basic derivatives; rules for the derivative of a sum, product, and quotient; chain rule for composite functions

Témakör kulcsszavai: derivative, product rule, quotient rule, chain rule

Témakör név: Applications of differential calculus

Témakör leírása: Equation of the tangent line at a given point; determination of the elasticity of a function. Sketching the graph of a function over a finite interval. Optimisation of economic functions by determining local maxima and minima

Témakör kulcsszavai: tangent line, elasticity, local maximum, local minimum

Tevékenység típusok

Kontakt előadás

Mérték: 28 tanóra (hour)

Leírás: Plenary lectures explaining basic theory, fundamental relationships and typical problems.

Kötelező: Igen

Becsült Idő: 28 óra

Kontakt gyakorlat

Mérték: 28 tanóra (hour)

Leírás: Practising calculations, basic problems and applications.

Kötelező: Igen

Becsült Idő: 28 óra

Otthoni gyakorlás

Mérték: 4 db (PCS)

Leírás: Zárthelyi dolgozatok előtt otthoni önálló gyakorlás. Before the 4 midterm exams practice problem solving on paper at home.

Kötelező: Nem

Becsült Idő: 28 óra

Tanórán kívüli kontakt konzultáció

Mérték: 14 db (PCS)

Leírás: Practicing in small groups

Kötelező: Nem

Becsült Idő: 14 óra

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

Számonkérési forma:

Folyamatos (Continued report)

Kötelező félévközi zárthelyik (számítógép által kiértékelt)

Mérték: 4 db (PCS)

Leírás: Complex test including simple and moderately complex calculations. Students can only use university computers (built in basic calculator), pen and empty paper.

Kötelező: Igen

Aláírás kialakításának módja:

Requirement for course signature: 25% or higher total scores of the 4 midterm tests. If the course does not end with a passing exam grade, the signature cannot be carried over to subsequent semesters.

Érdemjegy kialakításának módja:

Assessment type: Continued report (not exam!) Attendance is mandatory on lectures and practicals. Writing all 4 tests is compulsory for everyone, as the final grade will be based on them. Final grade determination: Based on the total score of the 4 assessments, grades are assigned as follows: 0%–49%: fail (1) 50%–62%: pass (2) 63%–74%: satisfactory (3) 75%–87%: good (4) 88%–100%: excellent (5) During the first week of the exam period (make-up week), the student may retake two selected tests due to absence or to improve a poor result. For grade determination, the score of the last attempt is taken into account. Students who have the signature and received a failing in-semester grade may improve once with a single combined exam in the exam period. Likewise, those whose in-semester grade is at least pass may take a one-time grade-improvement exam. In these cases, the grade of the last attempt is recorded.

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

Course page:

Course page and weekly learning materials and assignments will be published on <https://szelearning.sze.hu/>.

Recommended reading(s):

Selected chapters from:

Briggs et. al. (2013): Calculus for Scientists and Engineers. Pearson.

Akihito Asno (2013): An Introduction to Mathematics for Economics. Cambridge University Press

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL

Abramson, J. (Ed.): Precalculus 2e (2021), OpenStax. Rice University ISBN: ISBN-13: 978-1-951693-39-8
<https://openstax.org/books/precalculus-2e>

Derek Zweig: A Technical Guide to Mathematical Finance (2024), CRC Press ISBN: ISBN: 978-1-032-68596-0