INFORMATION ABOUT ADDITIONAL COURSES FOR ACADEMIC YEAR 2025/2026: PRIORITY: (1 YEAR; 2 YEAR; REMAINING YEARS)

a) the name of the course
Introduction to quantitative analysis

b) name and surname of the person conducting the course,
dr Damian Sołtysiak

c) planned hourly length of the course,
30x45min

d) the planned thematic scope of the course,

1–4. Differential Calculus
1.Derivative (single-variable): Definition & Rules — definition of the derivative; sum, product, quotient, and chain rules; derivatives of power, exponential, logarithmic, and trigonometric functions; higher-order derivatives.
2.Applications of Derivatives (single-variable) — monotonicity, local/global extrema, concavity and inflection points; L'Hôpital's Rule; rates of change.
3.Differentiation of Functions of Several Variables — partial derivatives, gradient and directional derivatives, extrema of functions of several variables.
4.Constrained Extrema — optimization with constraints, Lagrange multipliers.
5–6. Elements of Linear Algebra
5.Matrices — addition and multiplication; determinant; rank; identity and inverse matrices.
6.Linear Systems— Gaussian elimination; Cramer's Rule.
7–9. Probability Theory
7.Classical definition of probability, conditional probability
8.Discrete random variable: probability distribution function, expected value, variance
9.Continuous random variable: density, probability distribution function, uniform distribution, Normal distribution
10-12. Statistics
10.Basic statistics: mean, variance. Histogram, quantiles, empirical probability distribution function
11.Construction of confidence intervals
12.Hypotheses testing, concept of statistical significance, p-value, power of test

e) preliminary schedule of classes,

First meeting: **16.10** or **23.10** (**12.00 p.m. on-line 2x45min**)
Full schedule will be set at the first meeting.

f) information about the maximum number of participants
20