

TOPICS FOR ENTRANCE EXAMS, MASTER'S PROGRAMME

Study programme: Mathematics

Study branches: MA, MMIS, MMPT, MSTR, NCM, PMSE

1. Mathematical analysis

- Limits of a sequence, function.
- Convergence of infinite series.
- Investigating properties of real functions of a single real variable (domain, continuity, asymptotes, monotonicity, derivatives, local and global maxima, minima, convexity, concavity).
- Real functions of multiple real variables: Differential and partial derivatives. Implicit functions. Absolute extremes, extremes on a set.
- Integrals of functions of one and multiple real variables. Substitutions, integration by parts. Fubini's theorem. Integral with respect to a measure (Lebesgue, counting measure, product measures).

2. Linear algebra, vector spaces

- Vector space, linear independence, basis, dimension. Scalar product, orthogonalization.
- Matrix. Matrix operations. Rank of a matrix. Regularity. Determinants. Systems of linear equations.