DOCTORAL SCHOOL OF INFORMATICS
COMPLEX EXAM SUBJECT

Numerical solution of systems of equations (recommended subject)

Numerical solution methods for linear equation systems

Direct methods

Gauss, Gauss-Jordan method, LU decomposition, Cholesky method,

Householder transformation, QR decomposition

Iterative methods

Vector and matrix norms, general iteration principle,

Jacobi iteration, Gauss-Seidel iteration, relaxation methods

Singular decomposition, pseudo-solution

Solving nonlinear equations and systems of equations

Banach's fixed point theorem, the principle of simple iteration

Newton's method, Newton's method for systems of equations

Literature:

1. Hämmerlin H. - Hoffmann G.: Numerical Mathematics, Springer Verlag, 1991.

2. Golub G.H.-Van Loan C.F.: Matrix Computations. John Hopkins Univ. Press, Baltimore, 1989. (3rd ed. 1996)