

Study programme(s): Applied mathematics (MB), Master in Mathematics Teaching (MP)			
Level: master			
Course title: Numerical methods of linear algebra 2 (MB-03)			
Lecturer: Ljiljana D. Cvetković			
Status: obligatory for MB, elective for MP			
ECTS: 7			
Requirements: Numerical methods of linear algebra 1			
Learning objectives Mastering the basic algorithms of numerical linear algebra in MATLAB.			
Learning outcomes Students should be able to successfully use algorithms of numerical linear algebra built-in in MATLAB, and to independently solve easier problems in the field of applied linear algebra.			
Syllabus			
<i>Theoretical instruction</i> Iterative methods for solving systems of linear equations. SOR method. Summary of algorithms for finding the eigenvalues. Reducing to the Hessenberg form. Rayleigh quotient. Inverse iteration. QR algorithm. computation of SVD. Arnoldi iterations. GMRES. Conjugate gradients. Preconditioning. Solving the problem of least squares. Implementation of algorithms in MATLAB.			
<i>Practical instruction</i> Iterative methods for solving systems of linear equations. SOR method. Summary of algorithms for finding the eigenvalues. Reducing to the Hessenberg form. Rayleigh quotient. Inverse iteration. QR algorithm. computation of SVD. Arnoldi iterations. GMRES. Conjugate gradients. Preconditioning. Solving the problem of least squares. Implementation of algorithms in MATLAB.			
Literature			
1. Lloyd N. Trefethen and David Bau, III: Numerical Linear Algebra, SIAM, 1997. 2. James W. Demmel: Applied Numerical Linear Algebra, SIAM, 1997. 3. Roger A. Horn and Charles R. Johnson: Matrix Analysis, Cambridge University Press, 1999.			
Weekly teaching load			Other: 0
Lectures: 4	Exercises: 2	Other forms of teaching: 0	Student research: 0
Teaching methodology Lectures, revisions of the material, active students' participation in problem solving, knowledge tests - colloquia.			
Grading (maximum number of points 100)			
Pre-exam obligations	points	Final exam	points
Colloquia	50	written exam	50