Study program: Mathematics (Ph.D. program)

Course: Numerical Algorithms in Linear Algebra

Course instructor(s): Ljiljana Cvetković

Course type (compulsory/elective): elective

Credit points: 10 ECTS

Prerequisites: -

Course objectives:

Understanding and design of one's own algorithms in numerical linear algebra.

Learning outcomes:

The student will be able to apply various algorithms in numerical linear algebra and to modify them with respect to the concrete problem.

Course description (outline):

Systems of linear equations. Linear problems of least squares. Eigenvalues and eigenvectors. Projections onto Krilov subspaces. Orthogonalization. Reduction to Hessenberg's form. Algorithms in MATLAB.

References:

1. Lloyd N. Trefethen and David Bau, III: Numerical Linear Algebra, SIAM, 1997.
2. James W. Demmel: Applied Numerical Linear Algebra, SIAM, 1997, 431 pgs.
3. Leslie Hogben: Handbook of Linear Algebra, CRC Press, 2007, 1400 pgs.
4. Carl Dean Meyer: Matrix Analysis and Applied Linear Algebra, SIAM, 2000, 730 pgs.

Active teaching hours	**Theoretical classes:** 2	**Practice classes:** -6

Methods of teaching:

Lectures and practice, with active participation of the students, discussion, etc.

Grading structure

Pre-exam obligations	**Points**	**Exam**	**Points**
Colloquia	**25**	Oral exam	**25**
Seminars	**25**		