Study programme(s): Mathematics

Level: PhD studies

Course title: Iterative methods for linear problems (NM-01)

Lecturer: Ljiljana D. Cvetković

Status: optional

ECTS: 10

Requirements: Numerical methods of linear algebra 1 and 2

Learning objectives

Introduction to iterative methods in linear algebra and basic problems that arise there.

Learning outcomes

Students will be able to independently solve certain types of linear problems by choosing a proper iterative procedure.

Syllabus

Stationary iterative methods.
Procedures based on the projection methods to Krylov subspaces.
Convergence.
Preconditioning techniques.
Implementation of algorithms in MATLAB.

Literature

1. James W. Demmel: Applied Numerical Linear Algebra, SIAM, 1997, 431 pgs.
2. Yousef Saad: Iterative Methods for Sparse Linear Systems, SIAM, 2003, 536 pgs.
3. Henk A. van der Vorst: Iterative Krylov Methods for Large Linear Systems, Cambridge University Press, 2003, 236 pgs.
4. Anne Greenbaum: Iterative Methods for Solving Linear Systems, SIAM, 1997, 234 pgs.

Weekly teaching load				Other: 0
Lectures: 2	Exercises 0	Other forms of teaching: 0	Student research: 6	

Teaching methodology

Lectures, consultations, active participation of students in problem solving using MATLAB, knowledge tests - presentations at the seminars.

Grading method (maximal number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
Colloquia	50	written exam	50