Study programme(s): Applied Mathematics (MB)

Level: master

Course title: Numerical Optimization (MB-15)

Lecturer: Nataša Krejić

Status: elective

ECTS: 7

Requirements:

Learning objectives

To introduce student to the basic understanding of optimality conditions for unconstrained and constrained optimization as well as the main algorithms for solving nonlinear optimization problems. Practical implementation of the algorithms is also an objective of the course.

Learning outcomes

Functional knowledge of optimality conditions and the main algorithms for unconstrained and constrained optimization.

Syllabus

Theoretical instruction: Optimality conditions for unconstrained optimization. Line search methods. Trust region methods. Quasi Newton methods. Local convergence. Global convergence. Problems with linear constraints. Problems with nonlinear constraints. Interior point methods. Sequential quadratic programming. Large scale problems.

Practical instruction: Practical implementation of line search and trust region methods. Quasi Newton methods. Convergence analysis. Optimality conditions for constrained problems. Problems with linear constraints. Problems with nonlinear constraints. Interior point methods. Sequential quadratic programming. Large scale problems.

Literature

1. Nocedal, J., Wright, S., Numerical Optimization, Springer, 2006.

Weekly teaching load				Other:
Lectures: 4	Exercises: 2	Other forms of teaching:	Student research:	

Teaching methodology

Theoretical instructions followed by practical exercises.

Grading (total number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
practical problems		oral exam	50
tests		written exam	
colloquia	50		