Study programme(s): Applied Mathematics (MB), Mathematics (MA), Master in Mathematics Teaching (MP)

Level: master

Course title: Numerical analysis 2 (MB-01)

Lecturers: Nataša Krejić, Sanja Rapajić

Status: obligatory for MA and MB, elective for MP

ECTS: 7

Requirements:

Learning objectives

Enabling students to understand and apply complex numerical methods from theoretical and practical aspects. Upgrading knowledge of numerical analysis.

Learning outcomes

Students should be able to understand numerical algorithms, analyse problems and apply the methods taught in this course.

Syllabus

Theoretical instruction

Nonlinear equations - localisation of zeroes. Iterative methods (convergence, error estimation, exit criteria). Successive approximation method. Newton's method and its modifications. Iterative methods for systems of equations. Newton's method and its modifications. Local convergence. Global convergence. The method of least squares. Numerical methods for linear and nonlinear boundary problems.

Practical instruction

Computer implementation of the methods for nonlinear equations and systems of equations. The least squares method. Computer implementation of numerical methods for ODEs.

Literature

1. D. Herceg, N. Krejić, Numerical Analysis, Stylos, Novi Sad, 1997.
2. D. Herceg, N. Krejić, Numerical Analysis / Collection of Solved Problems, I and II, University of Novi Sad, 1997.
3. R. L. Burden, J.D. Faires, Numerical Analysis, Brooks Cole, 2010.

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

Teaching methodology

Lectures, exercises, analysis of examples with applications, writing reports and statistical analysis.

Grading (total number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
seminar	10	oral exam	
tests		written exam	50
colloquia	40		