Course Unit Descriptor

Study Programme: Applied Mathematics
Course Unit Title: Numerical Analysis 2
Course Unit Code: MB02
Name of Lecturer(s): Prof. Natasa Krejic
Type and Level of Studies: Master Academic Degree
Course Status (compulsory/elective): Compulsory
Semester (winter/summer): Winter
Language of instruction: English
Mode of course unit delivery (face-to-face/distance learning): face-to-face
Number of ECTS Allocated: 7.5
Prerequisites:

Course Aims: 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:

Theory: Nonlinear systems of equations. Iterative methods (convergence, error estimation, exit criteria). Successive approximation method. Newton's method and its modifications. Newton's method and its modifications. Local convergence. Global convergence. Unconstrained optimization problems - optimality conditions. Line search methods. The method of least squares. Numerical methods for linear and nonlinear ODEs boundary problems.

Practice: Practical exercises based on theoretical instructions. The exercises are performed on the blackboard, as well as in using software.

Required Reading:

1. Atkinson, K., Han, W., Theoretical Numerical Analysis, Springer, 2009

2. R. L. Burden, J.D. Faires, Numerical Analysis, Brooks Cole, 2010.

Weekly Contact Hours: 6	**Lectures:** 4	**Practical work:** 2

Teaching Methods:

Lectures followed by exercises and students' work.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Active class participation		written exam	
Practical work		oral exam	50
Preliminary exam(s)	50	…….	
Seminar(s)			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam,

project presentation, seminars, etc.