Level: bachelor

Course title: Numerical Analysis 1 (M4-16)

Status: obligatory

ECTS: 8

Requirements: none

Learning objectives

Acquiring basic knowledge and skills in numerical mathematics. Development of the mathematical mind for precision, exactness and calculation, and work habits. Use of computers in numerical problem solving.

Learning outcomes

Students will be able to apply simple numerical methods, develop skills to set up problems, implement and execute numerical algorithms, solve problems and interpret the solutions. Students should be able to link the mathematical knowledge with computer science and other subjects, be able to use mathematical software, pass their knowledge of numerical analysis to school pupils and students of mathematics.

Syllabus

Theoretical instruction

Approximate numbers and errors. Machine numbers and computer arithmetic. Error terms in function evaluation. Interpolation, interpolating polynomials and error terms. Numerical differentiation, difference quotients and error terms. Numerical integration. Quadrature formulas. Newton-Cotes formulas. Numerical equation solving. Localization of zeros. General iterative method. Special iterative methods.

Practical instruction

Exercises follow the classes and are conducted with *Mathematica*.

Weekly teaching load				Other: 0
Lectures: 3	Exercises: 4	Other forms of teaching: 0	Student research: 0	