Mathematical Analysis

Bachelor in Computer Science, 1st Year

UNIVERSITATEA BABEȘ-BOLYAI
BABEȘ-BOLYAI TUDOMÁNYEGYETEM
BABEȘ-BOLYAI UNIVERSITÄT
BABEȘ-BOLYAI UNIVERSITY

TRADITIO ET EXCELLENTIA

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Course information

Every week:

- ▶ Lecture
- ▶ Seminar
- ▶ Homework and bonus questions.

Evaluation:

- ▶ 60% final exam
- ▶ 30% midterm test on analysis in $\mathbb{R}$, week 8 (to be confirmed)
- ▶ 10% homework + seminar activity
- ▶ 5% bonus for extra homework.

Communication:

- ▶ Teams (muktfq0).
- ▶ Email (mihai.nechita@ubbcluj.ro).

Syllabus

1. Mathematical analysis in $\mathbb{R}$ (calculus in one variable)
   - ▶ Real numbers
   - ▶ Sequences
   - ▶ Series of real numbers
   - ▶ Limits of functions and continuity
   - ▶ Differentiation
   - ▶ Taylor series and power series
   - ▶ Integration

2. Mathematical analysis in $\mathbb{R}^n$ (multivariable calculus)
   - ▶ The Euclidean space $\mathbb{R}^n$
   - ▶ Partial derivatives and the gradient
   - ▶ Extremum points for functions of several variables
   - ▶ Optimization and gradient descent
   - ▶ Multiple integrals