

Spring Semester 2023

Numerical Methods

Syllabus

Summary

This course covers calculus-based numerical methods, in particular root finding, interpolation, approximation, quadrature (numerical integration), and a first introduction to the numerical solution of differential equations.

Contact information

Instructor Dr. Stephan Juricke
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Time and Place

Lectures: Thursday 14:15 – 15:30
Friday 14:15 – 15:30 (RLH-172 Conrad Naber Lecture Hall)

Textbook

- D. Kincaid and W. Cheney: Numerical Analysis: Mathematics of Scientific Computing, Any Brooks/Cole Publishing Company, 1991.
- G. Dalquist and A. Björck: Numerical methods, Dover Publications, 2003
- W. Boehm and H. Prautzsch: Numerical Methods, AK Peters, 1993 (further reading)

Grading The final grade will be computed as a percentage average with the following weights:

Exam:	100%
Homework:	up to 10% bonus (if exam wasn't failed; no more than 100% total)

Homework Starting next week, an assignment sheet approximately every two weeks is provided online. The following rules apply:

- Solutions are due at the time noted on the assignment sheets.
- Distribution of work sheets via Teams, submission of solutions via moodle.
- Peer review of submissions: Two randomly chosen students assess the work of another student. About one week to do the assessment via moodle. Solutions will be supplied.
- Late submissions are not possible due to the early release of solutions.
- A bonus homework and bonus questions will be provided as well.

Class Schedule

Month	Lecture Topics
Beginning of February	Introduction, Taylor series, number representation
February/March	Systems of linear equations, non-linear equations, interpolation methods
March	Least squares approximation, introduction to differentiation and integration
March/April	Linear equations revisited (iterative methods), interpolation revisited, integration/differentiation revisited
April/May	Applications to differential equations