Fakultät für Wirtschaftsinformatik
und Wirtschaftsmathematik

UNIVERSITÄT MANNHEIM

Lecture information

„Numerics for Ordinary Differential Equations“

Autumn term 2024

Lecturer

Thomas Schillinger	schillinger@uni-mannheim.de	B6, Room C 310

Administration

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Lecture/Exercise classes

Monday	10:15 – 11:45 Uhr	B6, Room A 101
Wednesday*	8:30 – 10:00 Uhr	A5, Room C 012

*Note that there will be lectures instead of exercise classes on the following days:

- Wednesday, September 18
- Wednesday, October 09
- Wednesday, October 30
- Wednesday, November 20

The first lecture will be on **02.09.2024**.
If there are any conflicts, please contact the lecturer.
The content of the lecture (script, exercises, etc.) is provided on ILIAS. Please check ILIAS regularly for further information. You will receive the password for ILIAS in the first lecture.

Further information

- **First exercise sheet** will be available online on **04.09.2024.**
- There will be **5 mandatory programming exercises**. Please work in pairs and hand in your solutions to the programming exercise within one week after the sheet is available online. Solutions must be uploaded in ILIAS.

- In the exercise class after the submission, there is a in-class discussion on the programming exercise in which a randomly selected pair has to present their submission.

Contents

This course covers basic numerical concepts for solving ordinary differential equations (ODEs) and gives insight to possible applications. Many problems stemming from science and engineering can be modelling using systems of ODEs. In general, those problems are difficult to solve analytically, therefore basic methods for numerical solutions are studied.

Admittance to the exam

Every participant needs to hand in a reasonable solution for each programming exercise. For the admission to the exam at least 75% of the exercises need to be successful and the discussion in the exercise class have to be attended.

Literature

Please consider the following books for supplementary reference:

- *Moler, C. B.*, Numerical computing with MATLAB, SIAM, 2004.
- *Deuflhard, P., Bornemann, F.*, Scientific Computing with Ordinary Differential Equations, Springer, 2002.
- *Deuflhard, P., Bornemann, F.*, Numerische Mathematik II, de Gruyter, 2008.
- *Quarteroni, A., Saleri, F.*, Scientific Computing with MATLAB, Springer, 2005.
- *Quarteroni, A., Sacco, R., Saleri, F.*, Numerical Mathematics, Springer, 2000.