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Fachbereich C – Mathematik und Naturwissenschaften
Angewandte Mathematik / Numerische Analysis

Numerical Analysis and Simulation I: ODEs

Information for the Winter Term 2014/15

Time and Place:

- **Lecture**:

  Monday, 16:15 - 17:45 in room G.14.34, starting October 13

  and Tuesday, 16:15 - 17:45 in room G.14.34, starting October 14

- **Exercises**:

  Monday, 8:30 - 10:00 in room G.15.34, starting October 20

  or Friday, 8:30 - 10:00 in room G.15.25, starting October 24

The course consists of a lecture with accompanying exercises. Thereby, the exercise hour serves as an intensification of the content of the lecture by actively solving and discussing some exercises. You will get an exercise sheet with two kinds of exercises - exercises and homework - every week. During the exercise hour, you can and *should* work in groups solving the *exercises* and discuss them with the assistant. Usually, they serve as an introduction for the (little bit) more complicated *homework*.

The *homework* has to be delivered each Tuesday before the lecture starting October 28. Thereby, you can solve it in groups of 2 or 3 people and hand in a joint contribution. At the end, you need 50 % of the total points to take part in the final examination. The *final examination* is a written examination of about 120 minutes.

Additionally, there is a course *Lab Exercises for Numerical Analysis and Simulation I: ODEs*. Here, the methods introduced in the lecture are implemented such that you get a feeling and deeper understanding of the numerical methods described in the lecture. This course is an extra course with own credit points and not obligatory, but most warmly recommended.

Literature:

- J. Stoer, R. Bulirsch: Introduction to Numerical Analysis. Springer, Berlin, 2002.(Chapter 7)
- A. Quarteroni, R. Sacco, F. Saleri: Numerical Mathematics. Springer, New York, 2007. (Chapter 11)
- P. Deuflhard, F. Bornemann: Scientific Computing with Ordinary Differential Equations. Springer, New York, 2002.
- E. A. Coddington: An introduction to ordinary differential equations, Prentice-Hall of India Pvt.Ltd, 1990.
- D. Griffiths, D. Higham; Numerical Methods for Ordinary Differential Equations, Springer London Ltd, 2010.
- E. Hairer, S. Nørsett, G. Wanner: Solving Ordinary Differential Equations I, Springer Berlin, 2009.
- E. Hairer, S. Nørsett, G. Wanner: Solving Ordinary Differential Equations II, Springer Berlin, 2010.

Additionally, you can find lecture notes on the web page.