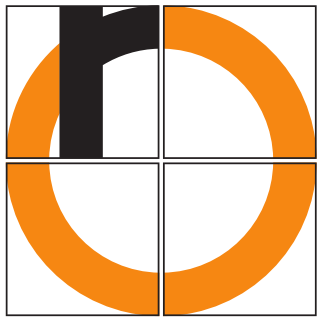
Technische Hochschule **Rosenheim**



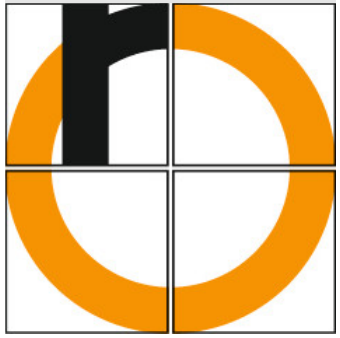
Analysis 2

Priv.-Doz. Dr. Sven-Joachim Kimmerle

Summer term 2022

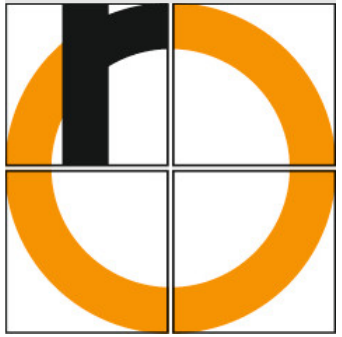
Bachelor Applied Artificial Intelligence (AAI)

Outline



Lecturer: Sven-Joachim Kimmerle

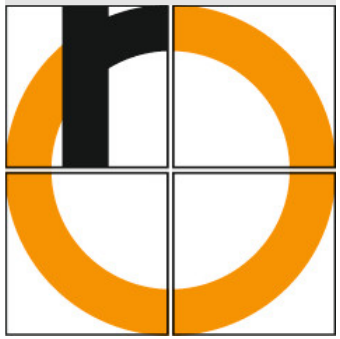
- 2000: “Vordiplom” in Mathematics & “Vordiplom” in Physics (U Heidelberg)
- 2002: Maîtrise in Mathematics (U Paris 7, France)
- 2004: Diploma in Mathematics (U Heidelberg)
- 2004-2009: Research center MATHEON, Berlin
- 2009: PhD in Mathematics (HU Berlin)
- 2010: Toyota/U Ottawa, Ottawa, Canada
- 2011-2018: Postdoc & deputy professor, UniBw München, Neubiberg
- 2019: “Habilitation” in Mathematics (UniBw München, Neubiberg)
- Since 2018: Physical Software Solutions GmbH, Münsing & Ottobrunn
- Since 2021: Lecturer (part-time), TH Rosenheim



What do you expect from the lecture?

* So far calculus in 1d → arbitrary dimensions
* in particular:
  Fourier analysis → Fourier series
  Fourier transforms

...



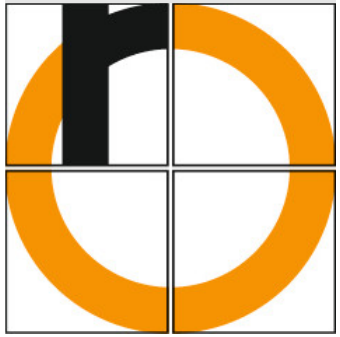
Aims of the course

Teaching mathematical basics (continued):

- Review of mathematics from Analysis 1 (& “school”)
- Completion of power series; Taylor series
- Fourier series
- Differentiation in higher dimensions
- Integration in higher dimensions
- Further topics: vector calculus, integral transformations (shortly)
- Mathematical thinking, techniques & working

In parallel this semester: Linear Algebra

- Systems of equations, matrices & vectors, eigenvalues, vector spaces, . . .



Administrative & organisational matters 1

4 SWS: ~ 2.67 hours lecture with ~ 1.33 hours exercise

- Lecture (2-3 hours per week)
  Thursday, 09:45-11:15 (every week) in A3.14
  Thursday, 11:45-13:15 (begin of the semester) in A3.14 with integrated exercises

  In presence (at least for the moment ...).
  Please wear masks at all times!

- 2 exercise groups:

  We start at the „middle" of the semester with 2 exercise groups instead of the 2nd lecture block.
  Thursday, 11:45-13:15 in A3.14
  Thursday, 13:45-15:15 in A3.14

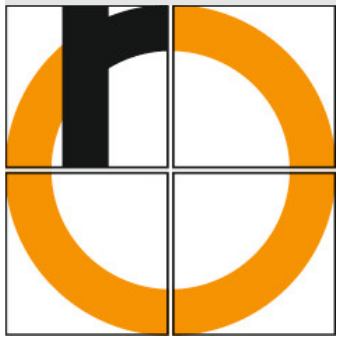
  In presence

  Please register later for a group in the LC!

In case of (technical) issues, we wait for 20 minutes!

first 4 weeks until Easter (see splan)

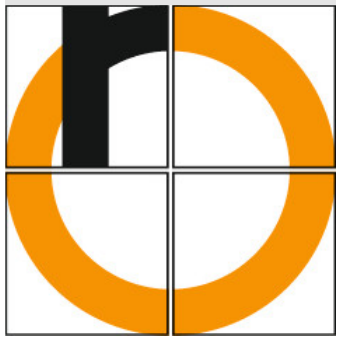
after Easter



Administrative & organisational matters 2

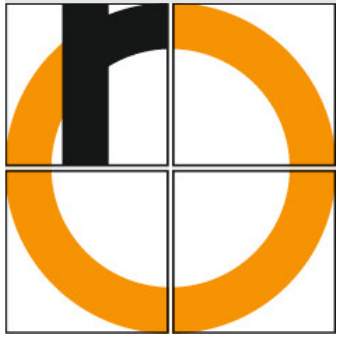
- Presentations, exercises and other material can be found in the Learning Campus (LC)
  - learning-campus.th-rosenheim.de
  - → Department ANG
    → Mathematics
    → Analysis 2 (AAI - B2), SoSe 2022
  - shortly: “Analysis 2 AAI, 22”
  - login: KenneIch!

- Office hours & contact
  - After each lecture/exercise group or
  - some time Wednesday afternoons or on Thursday
  - by appointment by email:
    `sven-joachim.kimmerle@th-rosenheim.de`



Marking

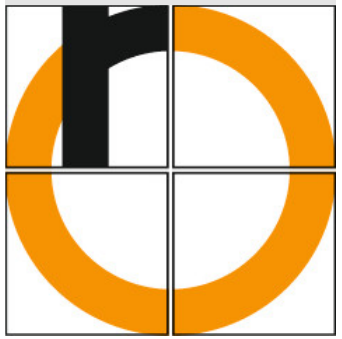
- **Examination type**
  - Written exam: 90 min.
  - Auxiliary tools: 1 sheet (DIN A4) both sides, hand written with formulas, e.g.
  - No calculators (or smartphones etc.) will be permitted.
- **Homework and bonus system**
  - Marked homework (bonus), sometimes in groups up to 2
  - To hand-in each Friday morning online, discussion next Thursday



Workload

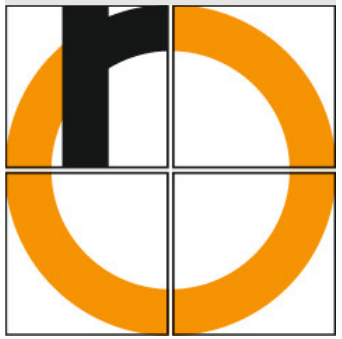
According to the module handbook for 5 ECTS we expect a workload of about 150 hours:

- 60 hours contact (in presence or virtual):
  $\sim$ 40 hours lecture, $\sim$ 20 hours exercise
- 90 hours independent study



Preliminaries:

- Good math skills from school or previous semesters
- Sound understanding of English
- Perseverance and endurance



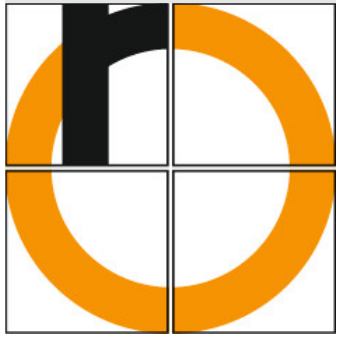
Recommended literature

- James Stewart: *Calculus*. Brooks/Cole, 6th edition, 2009.
- J. Hass, C. Heil, M.D. Weir: *Thomas' Calculus: Early transcendentals*. Pearsons, 14th edition, 1999.

In German only:

- Forster, O.: *Analysis 1*. Springer-Spektrum, 11. Auflage, 2013.
- Forster, O.: *Analysis 2*. Springer-Spektrum, 11. Auflage, 2017.
- Forster, O.: *Analysis 3*. Springer-Spektrum, 8. Auflage, 2017.

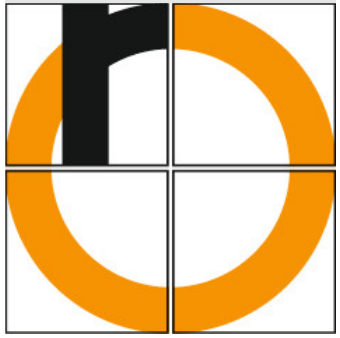
Further literature and material (software, e.g.) will be given during the course.



Copying ban

All materials made available in this lecture have been protected by me with a password, which has only been made available to the registered participants of this course.
Any form of distribution is prohibited!

Sven-Joachim Kimmerle



Revision

. . .

Discussion of the solutions of the Analysis 1 exam.