

Course Announcement: Dynamical Systems

Lecturer: **Christian Kuehn**

Basic Information

- Where? - **TU Munich**, FIM, Boltzmannstr. 3, room: tba.
- When? Sommersemester, Mondays **10:15-11:45** & **14:15-15:45**
- Language? - The course will be given in **English**.
- Target audience? - **Master students** and advanced **Bachelor students**.
- Background? A first basic course in ODEs in some form.
- Duration & Type? 4 SWS - Lecture (VO) + Exercises (register separately).
- Evaluation? - The exam will be **written** at the end of the course.
- Exam Duration? According to the current module description.
- Exam Details? No notes allowed, just bring a pen and your brain.
- Lecture Notes? - There will only be (partial) **lecture notes** for the course.

Course Content

The course provides an introduction to results and methods of dynamical systems. After successful completion of the module students are able to understand and apply the mathematical theory of dynamical systems stressing the analysis of geometric and topological properties of solutions of nonlinear ordinary differential equations as well as iterated maps in finite-dimensional Euclidean phase spaces. Planned topics: normal forms, invariant manifolds, local bifurcations, hyperbolic invariant sets, symbolic dynamics, strange attractors, introduction to chaos, global bifurcations, topological dynamics, entropy. Basic references will be [Kuz04, GH83]. Some supplements will be provided from [BS02].

Website

All relevant communication beyond this overview will be posted online, including lecture notes, announcements, and so on. The basic announcements and website will be:

Check TUM Moodle!

References

- [BS02] M. Brin and G. Stuck. *Introduction to Dynamical Systems*. CUP, 2002.
- [GH83] J. Guckenheimer and P. Holmes. *Nonlinear Oscillations, Dynamical Systems, and Bifurcations of Vector Fields*. Springer, New York, NY, 1983.
- [Kuz04] Yu.A. Kuznetsov. *Elements of Applied Bifurcation Theory*. Springer, New York, NY, 3rd edition, 2004.