

MA 692A/792-00A, Spring 2013, Dr. Günter Stolz
Monday and Wednesday, 3:30pm - 4:45pm, CH 402

Special Topics: Sturm-Liouville Theory

Tentative list of contents:

- Theory of selfadjoint extensions of symmetric operators
- Sturm-Liouville operators and their selfadjoint realizations, limit point/limit circle case and criteria
- Spectral theory of Sturm-Liouville operators (Weyl-Titchmarsh function, Green function, spectral representation)
- Absolutely continuous spectrum (subordinacy theory)
- Oscillation theory, Prüfer transform
- Floquet theory (SL operators with periodic coefficients)
- Concepts of scattering theory (reflection and transmission coefficients, scattering matrix)

Text materials: The content of Chapters 1 to 7 of J. Weidmann “Linear Operators in Hilbert Spaces” will be considered as background knowledge (up to the Spectral Theorem for unbounded self-adjoint operators). Alternatively, much of this material is also covered in the two-part book by Akhiezer and Glazman on “Theory of Linear Operators in Hilbert Space”.

The main source of material for the lectures will be parts of the more recent two-volume book by Weidmann “Lineare Operatoren in Hilberträumen”, Parts I and II, which has only been published in German. Thus it is planned to write a careful set of lecture notes on the material covered. Students taking the class for three credit hours are expected to contribute to the writing of these notes.

Each student should also give at least one of the class lectures. Materials for this will be provided.