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Course Description:

- Foundations of interpolation theory: the real method of Marcinkiewicz, the complex method of Riesz-Thorin, examples
- Abstract interpolation theory: real interpolation via the J and K methods, complex interpolation
- Connections to the theory of Sobolev spaces

Prerequisites:

- Measure theory and Lebesgue integration
- L^p spaces
- Basic theory of Banach and Hilbert spaces
- A minimal knowledge of complex analysis: holomorphic functions and the maximum modulus principle

Suggested references:

- J. Bergh and J. Löfstrom. *Interpolation Spaces: An Introduction*. Springer-Verlag, Berlin, 1976.
- J. Gustavsson. *Interpolation of Semi-Norms*. Technical report, Lund University, 1970
- G. Leoni. *A First Course in Sobolev Spaces, Second Edition*. American Mathematical Society, Providence, 2017.
- N. Stevenson, I. Tice. A truncated real interpolation method and characterizations of screened Sobolev spaces. *Comm. Pure Appl. Anal.* **19** (2020), no. 12, 5509–5566.
- H. Triebel. *Interpolation Theory, Function Spaces, Differential Operators*. North-Holland Publishing Co., Amsterdam, 1978.