Math 595—Banach spaces

Instructor/time: Marius Junge, MWF 11-11.50am

Prerequisites: Real Analysis 540


Course description: One of most powerful tools in the theory of Banach spaces is the so-called trace duality. Thus is a duality theory for linear maps on Banach spaces, and has been used in many occasions to detect properties of the underlying Banach spaces. We will illustrate this idea considering probabilistic aspects in the theory of Banach spaces, the notion of type and cotype, and the theory of $p$-summing maps.

In the second part we will consider similar problems in the category of operator spaces, that are quantized Banach spaces with an additional matrix structure. The best way is to understand these spaces as subspace of $C^*$-algebras. Our main intention here is to develop a calculus which is parallel to the classical Banach space theory. We will give applications to classical information and quantum information theory at the end.

We will use material from different sources, buying a textbook might not be necessary.


