Math 520a/320a
Instructor: Stefan Steinerberger
TTH 1:00-2:15
206 LOM

Measure Theory & Integration

First Meeting, Thursday, August 28, 2014

This course is concerned with measuring things and then summing them up. We will start with the notion of a measure, which generalizes familiar notions such as length or volume. We will then introduce the Lebesgue integral, which is a powerful generalization of the more elementary notions of antiderivatives and Riemann sums, and discuss some of its properties. We will then move on to a way of comparing measures and study the Radon-Nikodym theorem. After some introductory remarks on point set topology, we will try to understand the full power of the Lebesgue integral by studying the beautiful structures that arise when we look at associated function spaces: this will lead us to basic notions in functional analysis and Lebesgue spaces. If time allows, we will also survey some additional notions related to integration, for example basic Fourier analysis.

Fall Term 2014