MATH 420 / MATH 507: Measure Theory and Integration

(3 credits)

Section 101 - MWF 9–10 meets in Math 202.
Instructor: E. Perkins
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Office Hours: M 10:05-11:30; W 12:30-1:55

Text: *Real Analysis modern techniques and their applications, second ed.* by Gerald B. Folland, Wiley.

Further Reading:

Real Analysis by H. Royden.

Real Analysis and Probability, Real Analysis by R. Ash (these are two books–the latter is a subset of the former).

Real and Complex Analysis by W. Rudin.

Course Description

This is a cross-listed 4th year undergraduate and graduate course which develops the theory of measure and integration. This material is a cornerstone of mathematical analysis and is an essential part of an advanced mathematical education. It will be used in functional analysis, harmonic analysis, partial differential equations, probability, mathematical physics and information theory. The course will be based on the first 3 chapters of Folland's text, supplemented by some applications to probability.

Course Outline

1. Set theory, real numbers and metric spaces (brief review) (Chapter 0).
2. Measures (Chapter 1).
3. Integration (Chapter 2).
4. Differentiation of Measures (Chapter 3).

Prerequisites:

Undergraduate analysis at the level of UBC Math 320/321 (equivalent to 68% or higher in Math 321).

Grading Scheme

Regular Assignments (weekly or biweekly and posted on the course webpage): 50

Final exam: 50

Policy on missed assignments

Students who are unable to hand in a homework due to a medical or equivalent excuse will have that hw not count towards their final grade.