Spring 2020

MATH 7366-1: Stochastic Analysis

Time: Monday, Wednesday, Friday 1:30–2:20

Room: Lockett 243

Prerequisite

Undergraduate probability theory such as Math 3355 or Math 4058

Textbooks

1. H.-H. Kuo: Introduction to Stochastic Integration, Universitext, Springer, 2006
2. H.-H. Kuo: Stochastic Integration for Anticipating Stochastic Processes, in preparation.

Coverage

The main aim of this course is to study a new theory of stochastic integration which I introduced in 2008. This new theory is an extension of the Itô theory of stochastic integration to stochastic processes which may not be adapted. We will cover the following subjects:

1. A brief review of the Itô theory from a new viewpoint which will enable us to introduce stochastic integrals of anticipating integrands.
2. We will briefly describe the white noise theory for the part on stochastic integration in order to compare the white noise approach and the new theory of stochastic integration.
3. A new theory of stochastic integration with integrands containing adapted stochastic processes and instantly independent stochastic processes. We will give many examples to motivate new concepts of near-martingale property and near-Markov property. In addition we will propose research problems for further investigation of this new theory.

Grading

The grade will be determined by homework (40%), presentation (20%), and the final exam (40%) with the following tentative scale by using the new university grading system:

$96 \le A^+ \le 100$	$92 \le A \le 95$	$88 \le A^- \le 91$
$84 \le B^+ \le 87$	$80 \le B \le 83$	$76 \le B^- \le 79$
$73 \le C^+ \le 75$	$70 \le C \le 72$	$67 \le C^- \le 69$
$64 \le D^+ \le 66$	$61 \le D \le 63$	$58 \le D^- \le 60$
$F \le 57$		

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