MATH 7366-1: Stochastic Analysis

Time: Monday, Wednesday, Friday 10:30–11:20

Room: Lockett 277

Prerequisite
  Math 7311 Real Analysis I

Textbooks
  1. H.-H. Kuo: Gaussian Measures in Banach Spaces. Lecture Notes in Math. vol. 463, Springer, 1975. (Reprinted by Amazon, 2006)
  2. H.-H. Kuo: White Noise Distribution Theory, CRC Press, 1996
  3. H.-H. Kuo: Introduction to Stochastic Integration. Universitext, Springer, 2006

Coverage We will cover the following three topics in stochastic analysis:
  1. Abstract Wiener space: Gauss measures, measurable norms, Gross-Sazonov theorem, transformation formula, Gaussian processes, heat equation.
  2. White noise theory: Theory of generalized functions, Minlos theorem, white noise functionals, characterization theorems, Hitsuda-Skorokhod integral.
  3. Stochastic integration: Brownian motion, Wiener integral, Itô integral, Itô's formula, Girsanov theorem, multiple Wiener-Itô integrals, extension of the Itô theory to anticipating stochastic processes.

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:

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

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