Advanced Probability
MAth 5411
HKUST

Access for help:

All students are *strongly encouraged* to get help from the instructor by asking questions in or right after each class, or by emailing to the instructor Kani Chen at "makchen@ust.hk", dropping by the instructor's office, Room 3477, or calling the instructor at 2358-7425;

Main References:

0. Lecture Notes: to be posted about once every three weeks.

1. Textbook: *"Probability: Theory and Examples"*, 3rd edition, by Rick Durrett, Publisher: Thomson Brooks/Cole. ISBN: 0534424414.

2. *"Probability Theory: Independence, Interchangeability, Martingales"*, 3nd edition, by Yuan Shih Chow and Henry Teicher; Publisher: Springer-Verlag. ISBN: 0387982280.

3. *"A Course in Probability Theory"*, 3rd edition, by Kai Lai Chung; Publisher: Academic press. ISBN: 0121741516.

Gradings and Exams:

Exercises shall be assigned but not collected. The grades are 100% based on the final exam.

Course Contents:

1. Chapter 1: Some basic concepts in measure theory, probability spaces, random variables, convergence of random variables, Borel-Cantelli lemma, weak and strong laws of large numbers under various conditions, large deviation, convergence of series.

2. Chapter 2: the central limit theorem; Lindeberg-Feller conditions, characteristic functions.

3. Chapter 3: random walk, stopping times, Wald's identity.

4. Chapter 4: martingale: definitions and main results.

Subjects 3 and 4 may only be lightly touched.