

MARTINGALE THEORY
(MATH 36204, MATH M6204)
AUTUMN 2016
PRELIMINARY SCHEDULE

Week 01, 26 Sep – 02 Oct, and

Week 02, 03 Oct – 09 Oct:

Crash course on measure theory and conditional expectation:

Measure and Lebesgue integral. Limits of integrals: Fatou Lemma, Monotone Convergence Theorem, Dominated Convergence Theorem. Convexity: Jensen, Cauchy-Schwarz inequalities. L^1 and L^2 spaces. Radon-Nikodym and Lebesgue decomposition theorems. Conditional expectation a la Kolmogorov.

Week 03, 10 Oct – 16 Oct:

Filtrations, martingales. Gambling and discrete stochastic integration. Stopping times, stopped martingales.

Week 04, 17 Oct – 23 Oct:

Optional Stopping Theorem. Applications.

Week 05, 24 Oct – 30 Nov:

Martingale Convergence Theorem. Applications.

Week 06, 1 Dec– 06 Dec:

Maximal Inequality. Applications.