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Lecture 0. 19.2.2018.

London Taught Course Centre

MEASURE-THEORETIC PROBABILITY

Professor N. H. BINGHAM, Spring 2018

Mathematics Department, Imperial College; Weeks Hall 702; 020-7594 2085; n.bingham@ic.ac.uk

Course website: My homepage, link to Measure-Theoretic Probability. This also contains past exam papers + solutions.

This 10-hour course [5 weeks, 2 hours each] can cover only the bare essentials of a vast subject, and of course there is very much more to say. For a 20-hour version see the Stochastic Analysis link on my homepage [10 x 2 hours, LSE]; for a 30-hour version see the Stochastic Processes link on my homepage [30 x 1 hour, Imperial]. For a range of useful books, see the References after the Table of Contents below.

Contents

Week 3. 5.3.2018. Chapter III: Martingales.
§1. Discrete-parameter martingales.
§2. Martingale convergence.
§3. Uniformly integrable martingales.
§4. Stopping times and optional stopping.
§5. Doob decomposition.
§6. Examples.
§7. Continuous-parameter martingales.
§8. Poisson processes; Lévy processes

Week 4. 12.3.2018. Chapter IV: Stochastic processes in continuous time. Brownian motion.
§1. Markov processes.
§2. Gaussian processes.
§3. Brownian motion.

Week 5. 19.3.2018. Chapter V: Itô (stochastic) calculus. Weak convergence.
§1. Quadratic variation.
§2. Itô integral.
§3. Itô's formla.
§4. Weak convergence.

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