School of Mathematics

Course 412 — Probability 1998-99
(J.S./S.S. Mathematics)

Lecturer: Professor J T Lewis

Requirements/prerequisites:

Duration: Michaelmas, Hilary and Trinity

Number of lectures per week:

Assessment:

End-of-year Examination:

Description:
I. Discrete Probability Spaces:

Sample Space, Events, Probabilities, Combination of Events.
Conditional Probabilities, Stochastic Independence, Random Variables, Expectations, Conditional Expectations.

Random Walk: Probabilities of Ruin, Mean Duration, Reflection Principle, Arc Sine Law.
Martingales: Application to Random Walk.
Markov Chains: Ergodic Theorem, Strong Markov property.

II. General Probability Spaces:

Measure Spaces, Events, Random Variables, Independence, Integration, Expectations, Conditional Expectations.
Martingales:
Black-Scholes Theorem, The Kalman-Bucy Filter.
Weak Convergence, Central Limit Theorem.

June 10, 1998