



University of Pretoria Yearbook 2020

Measure theory and probability 734 (WTW 734)

Qualification Postgraduate

Faculty Faculty of Natural and Agricultural Sciences

Module credits 15.00

Programmes BScHons Applied Mathematics

BScHons Mathematics

BScHons Mathematics and Mathematics Education Algebra and Analysis

BScHons Mathematics and Mathematics Education Applied Analysis

BScHons Mathematics and Mathematics Education Differential Equations and Modelling

BScHons Mathematics of Finance

Prerequisites Real analysis on third-year level

Contact time 2 lectures per week

Language of tuition Module is presented in English

Department Mathematics and Applied Mathematics

Period of presentation Semester 1

Module content

Measure and integration theory: The Caratheodory extension procedure for measures defined on a ring, measurable functions, integration with respect to a measure on a σ -ring, in particular the Lebesgue integral, convergence theorems and Fubini's theorem.

Probability theory: Measure theoretic modelling, random variables, expectation values and independence, the Borel-Cantelli lemmas, the law of large numbers. L^1 -theory, L^2 -theory and the geometry of Hilbert space, Fourier series and the Fourier transform as an operator on L^2 , applications of Fourier analysis to random walks, the central limit theorem.

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