University of Pretoria Yearbook 2022

Measure theory and probability 734 (WTW 734)

Qualification	Postgraduate
Faculty	Faculty of Natural and Agricultural Sciences
Module credits	15.00
NQF Level	08
Programmes	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 *Applied Mathematics*
	BScHons *Mathematics*
	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.

specific regulations and information as stipulated in the relevant yearbook. Ignorance concerning these regulations will not be accepted as an excuse for any transgression, or basis for an exception to any of the aforementioned regulations.