

University of Pretoria Yearbook 2019

Functional analysis 710 (WTW 710)

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 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

An introduction to the basic mathematical objects of linear functional analysis will be presented. These include metric spaces, Hilbert spaces and Banach spaces. Subspaces, linear operators and functionals will be discussed in detail. The fundamental theorems for normed spaces: The Hahn-Banach theorem, Banach-Steinhaus theorem, open mapping theorem and closed graph theorem. Hilbert space theory: Riesz' theorem, the basics of projections and orthonormal sets.

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