



University of Pretoria Yearbook 2022

Functional analysis 710 (WTW 710)

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 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

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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