

# University of Pretoria Yearbook 2022

## Dynamical systems 382 (WTW 382)

**Qualification** Undergraduate

**Faculty** [Faculty of Natural and Agricultural Sciences](#)

**Module credits** 18.00

**NQF Level** 07

**Programmes** [BCom \(Statistics and Data Science\)](#)

[BCom](#)

[BSc \(Meteorology\)](#)

[BSc \(Actuarial and Financial Mathematics\)](#)

[BSc \(Applied Mathematics\)](#)

[BSc \(Chemistry\)](#)

[BSc \(Geology\)](#)

[BSc \(Mathematical Statistics\)](#)

[BSc \(Mathematics\)](#)

[BSc \(Physics\)](#)

**Service modules** Faculty of Engineering, Built Environment and Information Technology

Faculty of Education

Faculty of Economic and Management Sciences

**Prerequisites** WTW 218 and WTW 286/264

**Contact time** 1 tutorial per week, 2 lectures per week

**Language of tuition** Module is presented in English

**Department** Mathematics and Applied Mathematics

**Period of presentation** Semester 1

### Module content

Matrix exponential function: homogeneous and non-homogeneous linear systems of differential equations. Qualitative analysis of systems: phase portraits, stability, linearisation, energy method and Liapunov's method. Introduction to chaotic systems. Application to real life problems.

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