

# University of Pretoria Yearbook 2022

## Mathematical and computational finance 831 (WTW 831)

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| <b>Qualification</b>          | Postgraduate   |
| <b>Faculty</b>                | <a href="#">Faculty of Natural and Agricultural Sciences</a> |
| <b>Module credits</b>         | 1.00   |
| <b>NQF Level</b>              | 09   |
| <b>Prerequisites</b>          | Financial Engineering on honours level                       |
| <b>Contact time</b>           | 1 lecture per week   |
| <b>Language of tuition</b>    | Module is presented in English                               |
| <b>Department</b>             | Mathematics and Applied Mathematics                          |
| <b>Period of presentation</b> | Semester 1   |

### Module content

\*Consult with the Head of the Department of Mathematics and Applied Mathematics about the availability of this master's module in a particular year.

Stochastic Calculus: Multidimensional Itô formula, correlated Wiener processes, the infinitesimal operator, SDE's, PDE's, the Kolmogorov equations, martingales, stochastic integral representations and Girsanov's theorem. The martingale approach to arbitrage theory. Bonds and interest rates: Martingale models, standard models, the Heath-Jarrow-Morton framework. Monte Carlo methods. Finite difference methods.

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