

# University of Pretoria Yearbook 2025

## Stochastic processes 312 (WST 312)

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| <b>Qualification</b>          | Undergraduate  |
| <b>Faculty</b>                | <a href="#">Faculty of Economic and Management Sciences</a>  |
| <b>Module credits</b>         | 18.00  |
| <b>NQF Level</b>              | 07   |
| <b>Programmes</b>             | <a href="#">BCom specialising in Econometrics</a><br><a href="#">BCom specialising in Statistics and Data Science</a><br><a href="#">BSc in Actuarial and Financial Mathematics</a><br><a href="#">BSc in Applied Mathematics</a><br><a href="#">BSc in Chemistry</a><br><a href="#">BSc in Chemistry 4-year programme</a><br><a href="#">BSc in Mathematical Statistics</a><br><a href="#">BSc in Mathematics</a><br><a href="#">BSc in Mathematics 4-year programme</a><br><a href="#">BSc in Physics</a><br><a href="#">BSc in Physics 4-year programme</a> |
| <b>Service modules</b>        | Faculty of Economic and Management Sciences<br>Faculty of Natural and Agricultural Sciences  |
| <b>Prerequisites</b>          | WST 211, WST 221, WTW 211 GS and WTW 218 GS  |
| <b>Contact time</b>           | 1 practical per week, 2 lectures per week  |
| <b>Language of tuition</b>    | Module is presented in English   |
| <b>Department</b>             | Statistics   |
| <b>Period of presentation</b> | Semester 1   |

### Module content

Definition of a stochastic process. Stationarity. Covariance stationary. Markov property. Random walk. Brownian motion. Markov chains. Chapman-Kolmogorov equations. Recurrent and transient states. First passage time. Occupation times. Markov jump processes. Poisson process. Birth and death processes. Structures of processes. Structure of the time-homogeneous Markov jump process. Applications in insurance. Practical statistical modelling, analysis and simulation using statistical computer packages and the interpretation of the output.

### **General Academic Regulations and Student Rules**

The [General Academic Regulations \(G Regulations\)](#) and [General Student Rules](#) apply to all faculties and registered students of the University, as well as all prospective students who have accepted an offer of a place at the University of Pretoria. On registering for a programme, the student bears the responsibility of ensuring that they familiarise themselves with the General Academic Regulations applicable to their registration, as well as the relevant faculty-specific and programme-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. The G Regulations are updated annually and may be amended after the publication of this information.

### **Regulations, degree requirements and information**

The faculty regulations, information on and requirements for the degrees published here are subject to change and may be amended after the publication of this information.

### **University of Pretoria Programme Qualification Mix (PQM) verification project**

The higher education sector has undergone an extensive alignment to the Higher Education Qualification Sub-Framework (HEQSF) across all institutions in South Africa. In order to comply with the HEQSF, all institutions are legally required to participate in a national initiative led by regulatory bodies such as the Department of Higher Education and Training (DHET), the Council on Higher Education (CHE), and the South African Qualifications Authority (SAQA). The University of Pretoria is presently engaged in an ongoing effort to align its qualifications and programmes with the HEQSF criteria. Current and prospective students should take note that changes to UP qualification and programme names, may occur as a result of the HEQSF initiative. Students are advised to contact their faculties if they have any questions.