



# Universiteit van Pretoria Jaarboek 2018

## BScHons Wiskundige Statistiek (02240192)

**Minimum duur van studie** 1 jaar

**Totale krediete** 135

### Programinligting

Hierdie inligting is slegs in Engels beskikbaar.

Details of compilation of curriculum are available from the Head of the Department of Statistics as well as from the departmental postgraduate brochure.

A candidate must compile his/her curriculum in consultation with the head of department or his representative. It is also possible to include postgraduate modules from other departments. Refer to the Departmental website for further information.

#### Renewal of registration

1. Subject to exceptions approved by the Dean, on the recommendation of the head of department, and in the case of distance education where the Dean formulates the stipulations that will apply, a student may not sit for an examination for the honours degree more than twice in the same module.
2. A student for an honours degree must complete his or her study, in the case of full-time students, within two years and, in the case of after-hours students, within three years of first registering for the degree and, in the case of distance education students, within the period stipulated by the Dean. Under special circumstances, the Dean, on the recommendation of the head of department, may give approval for a limited extension of this period.

In calculating marks, General Regulation G.12.2 applies.

Apart from the prescribed coursework, a research project is an integral part of the study.

### Toelatingsvereistes

- A relevant bachelor's degree with Mathematical Statistics on the 300-level is required.
- For BScHons in Mathematical Statistics, an average mark of 65% or more
  - (i) in Mathematical statistics on the 300-level or
  - (ii) in an equivalent statistical module(s) at an accredited institution is required.
- In addition to passing of the core modules, WST 312 is also required as prerequisite for BScHons and BComHons in Mathematical Statistics.
- Students from other accredited institutions must comply with the same requirements based on equivalent modules at their institutions. In addition, students from other accredited institutions must also pass an entrance evaluation.
- Student numbers are limited to a maximum of 40, collectively over all honours programmes in the Department of Statistics. Selection is based on performance in the prior degree, conditional on ii and iii above.



- Historical performance during prior studies will also be considered in selecting students. Specific attention will be given to modules repeated and duration of study.
- Any additional entrance requirements as specified by the head of department in consultation with the departmental postgraduate selection committee.
- International qualifications have to be evaluated by SAQA.

## Bevordering tot volgende studiejaar

The progress of all honours candidates is monitored biannually by the postgraduate coordinator/head of department. A candidate's study may be terminated if the progress is unsatisfactory or if the candidate is unable to finish his/her studies during the prescribed period.

## Slaag met lof

The BScHons degree is awarded with distinction to a candidate who obtains a weighted average of at least 75% in all the prescribed modules and a minimum of 65% in any one module.



## Kurrikulum: Finale jaar

Minimum krediete: 135

### Kernmodules

#### Lineêre modelle 710 (LMO 710)

**Modulekrediete** 15.00

**Diensmodules** Fakulteit Natuur- en Landbouwetenskappe

**Voorvereistes** WST 311, WST 312, WST 321 en WST 322

**Kontaktyd** 1 lesing per week

**Onderrigtaal** Module word in Engels aangebied

**Departement** Statistiek

**Aanbiedingstydperk** Semester 1

#### Module-inhoud

\*Hierdie inligting is slegs in Engels beskikbaar.

Projection matrices and sums of squares of linear sets. Estimation and the Gauss-Markov theorem. Generalised t- and F- tests.

#### Meerveranderlike analise 710 (MVA 710)

**Modulekrediete** 15.00

**Diensmodules** Fakulteit Gesondheidswetenskappe

**Voorvereistes** WST 311, WST 312, WST 321 en WST 322

**Kontaktyd** 1 lesing per week

**Onderrigtaal** Module word in Engels aangebied

**Departement** Statistiek

**Aanbiedingstydperk** Semester 1

#### Module-inhoud

\*Hierdie inligting is slegs in Engels beskikbaar.

Matrix algebra. Some multivariate measures. Visualising multivariate data. Multivariate distributions. Samples from multivariate normal populations. The Wishart distribution. Hotelling's  $T^2$  statistic. Inferences about mean vectors.

#### Navorsingsoriëntasie 796 (STK 796)

**Modulekrediete** 0.00

**Diensmodules** Fakulteit Ekonomiese en Bestuurswetenskappe

**Voorvereistes** Geen voorvereistes.

**Kontaktyd** Ad Hoc



**Onderrigtaal** Module word in Engels aangebied

**Departement** Statistiek

**Aanbiedingstydperk** Jaar

### Module-inhoud

\*Hierdie inligting is slegs in Engels beskikbaar.

A compulsory bootcamp must be attended as part of this module – usually presented during the last week of January each year (details are made available by the department ). The bootcamp will cover the basics of research to prepare students for the research component of their degree. The bootcamp should be done in the same year as registration for STK 795/WST 795. Each year of registration for the honours degree will also require the attendance of three departmental seminars. Students should ensure that their attendance is recorded by the postgraduate co-ordinator present at the seminars. The department approves the seminars attended. In addition, students are required to present their STK 795/WST 795 research in the department during the year of registration for these modules.

## Navorsingsverslag: Wiskundige statistiek 795 (WST 795)

**Modulekrediete** 30.00

**Voorvereistes** WST 311, WST 312, WST 321 en WST 322

**Onderrigtaal** Module word in Engels aangebied

**Departement** Statistiek

**Aanbiedingstydperk** Semester 1 en Semester 2

### Module-inhoud

\*Hierdie inligting is slegs in Engels beskikbaar.

Refer to the document: Criteria for the research management process and the assessment of the honours essays, available on the web: [www.up.ac.za](http://www.up.ac.za) under the Department of Statistics: postgraduate study.

## Keusemodules

### Inleiding tot statistiese leer 720 (EKT 720)

**Modulekrediete** 15.00

**Diensmodules** Fakulteit Natuur- en Landbouwetenskappe

**Voorvereistes** RAL 780, WST 311, 312, 321, 322

**Kontaktyd** 1 lesing per week, 1 webgebaseerde periode per week

**Onderrigtaal** Module word in Engels aangebied

**Departement** Statistiek

**Aanbiedingstydperk** Semester 2



## Module-inhoud

\*Hierdie inligting is slegs in Engels beskikbaar.

The emphasis is on the theoretical understanding and practical application of advances in statistical modelling. The following topics are covered: Single equation models: Nonparametric regression. Bootstrap procedures within regression analysis, k-nearest neighbour classification. Modelling categorical dependent variables - Logit/Probit models. Multiple outputs. Linear regression of an indicator matrix. Ridge regression. Non-linear regression modelling. Some new developments in regression and classification. Simultaneous equation models: Specification, identification and estimation of simultaneous equation models.

## Lineêre modelle 720 (LMO 720)

<b>Modulekrediete</b>	15.00
<b>Diensmodules</b>	Fakulteit Natuur- en Landbouwetenskappe
<b>Voorvereistes</b>	LMO 710
<b>Kontaktyd</b>	1 lesing per week
<b>Onderrigtaal</b>	Module word in Engels aangebied
<b>Departement</b>	Statistiek
<b>Aanbiedingstydperk</b>	Semester 2

## Module-inhoud

\*Hierdie inligting is slegs in Engels beskikbaar.

The singular normal distribution. Distributions of quadratic forms. The general linear model. Multiple comparisons. Analysis of covariance. Generalised linear models. Analysis of categorical data.

## Meerveranderlike analise 720 (MVA 720)

<b>Modulekrediete</b>	15.00
<b>Diensmodules</b>	Fakulteit Gesondheidswetenskappe Fakulteit Natuur- en Landbouwetenskappe
<b>Voorvereistes</b>	MVA 710
<b>Kontaktyd</b>	1 lesing per week
<b>Onderrigtaal</b>	Module word in Engels aangebied
<b>Departement</b>	Statistiek
<b>Aanbiedingstydperk</b>	Semester 2

## Module-inhoud

\*Hierdie inligting is slegs in Engels beskikbaar.

The matrix normal distribution, correlation structures and inference of covariance matrices. Discriminant analysis. Principal component analysis. The biplot. Multidimensional scaling. Exploratory factor analysis. Confirmatory Factor analysis and structural equation models.



## Parametriese en nie-parametriese stogastiese prosesse 720 (PNP 720)

<b>Modulekrediete</b>	15.00
<b>Diensmodules</b>	Fakulteit Ekonomiese en Bestuurswetenskappe
<b>Voorvereistes</b>	WST 312
<b>Kontaktyd</b>	1 lesing per week
<b>Onderrigtaal</b>	Module word in Engels aangebied
<b>Departement</b>	Statistiek
<b>Aanbiedingstydperk</b>	Semester 2

### Module-inhoud

\*Hierdie inligting is slegs in Engels beskikbaar.

Introduction to statistical measure theory. Queueing processes: M/M/1; M/M/S; M/G/1 queues and variants; limiting distribution of the queue length and waiting times. Queueing networks. Some stochastic inventory and storage processes.

## Steekproefnemingstegnieke 720 (SFT 720)

<b>Modulekrediete</b>	15.00
<b>Diensmodules</b>	Fakulteit Natuur- en Landbouwetenskappe
<b>Voorvereistes</b>	BScHons: WST 311, WST 312, WST 321, WST 322; BComHons: STK 310, 320
<b>Kontaktyd</b>	1 lesing per week
<b>Onderrigtaal</b>	Module word in Engels aangebied
<b>Departement</b>	Statistiek
<b>Aanbiedingstydperk</b>	Semester 1

### Module-inhoud

Simple random sampling. Estimation of proportions and sample sizes. \*Hierdie inligting is slegs in Engels beskikbaar.

Stratified random sampling. Ratio and regression estimators. Systematic and cluster sampling. Complex survey methodology. Handling of nonresponse.

## Statistiese proseskontrole 780 (SPC 780)

<b>Modulekrediete</b>	15.00
<b>Diensmodules</b>	Fakulteit Natuur- en Landbouwetenskappe
<b>Voorvereistes</b>	STK 310, 320 or WST 311, 312, 321, 322
<b>Kontaktyd</b>	1 lesing per week
<b>Onderrigtaal</b>	Module word in Engels aangebied
<b>Departement</b>	Statistiek
<b>Aanbiedingstydperk</b>	Semester 1



## Module-inhoud

\*Hierdie inligting is slegs in Engels beskikbaar.

Quality control and improvement. Shewhart, cumulative sum (CUSUM), exponentially weighted moving average (EWMA) and Q control charts. Univariate and multivariate control charts. Determining process and measurement systems capability. Parametric and nonparametric (distribution-free) control charts. Constructing control charts using Microsoft Excel and/or SAS. Obtaining run-length characteristics via simulations, the integral equation approach, other approximate methods and the Markov-chain approach.

## Tydreeksanalise 720 (TRA 720)

**Modulekrediete** 15.00

**Diensmodules** Fakulteit Natuur- en Landbouwetenskappe

**Voorvereistes** STK 310 en STK 320

**Kontaktyd** 1 lesing per week

**Onderrigtaal** Module word in Engels aangebied

**Departement** Statistiek

**Aanbiedingstydperk** Semester 2

## Module-inhoud

\*Verwys na die Engelse weergawe van die Course Catalogue.

## Verdelingsvrye metodes 710 (VMT 710)

**Modulekrediete** 15.00

**Diensmodules** Fakulteit Natuur- en Landbouwetenskappe

**Voorvereistes** WST 311, WST 312, WST 321 en WST 322

**Kontaktyd** 1 lesing per week

**Onderrigtaal** Module word in Engels aangebied

**Departement** Statistiek

**Aanbiedingstydperk** Semester 1

## Module-inhoud

\*Hierdie inligting is slegs in Engels beskikbaar.

A selection of: Nonparametric stochastic processes. Power and asymptotic power of distribution-free procedures. Theory and simulation. Asymptotic relative efficiency. Linear rank tests: Definition, properties and applications. Equal in distribution technique. Counting and ranking statistics. Introduction to one and two sample U-statistics. Permutation and distribution-free rank-like statistics. Multi-sample distribution-free tests, rank correlation and regression. Some nonparametric bootstrap and smoothing methods.

Die inligting wat hier verskyn, is onderhewig aan verandering en kan na die publikasie van hierdie inligting gewysig word.. Die [Algemene Regulasies \(G Regulasies\)](#) is op alle fakulteite van die Universiteit van Pretoria van toepassing. Dit word vereis



dat elke student volkome vertrouwd met hierdie regulasies sowel as met die inligting vervat in die [Algemene Reëls](#) sal wees. Onkunde betreffende hierdie regulasies en reëls sal nie as 'n verskoning by oortreding daarvan aangebied kan word nie.