University of Pretoria Yearbook 2018

BComHons Statistics (07240062)

Minimum duration of study	1 year
Total credits	120
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Admission requirements

- Relevant BCom degree with with an average of at least 65% in Statistics or equivalent on 3rd year level.
- For BCom Honours(Statistics) specialising in Economic Statistics, at least 65% in Economics on 3rd year level.
- Student numbers are limited to a maximum of 40 collectively over all honours programmes in the Department of Statistics.
- Historical performance during prior studies will also be considered in selecting students. Specific attention will be given to modules repeated and duration of study.
- The head of departement reserves the right to prescribe additional modules in consultation with the departmental postgraduate selection committee.

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.

1. Registration for a second field of study

With reference to General Regulation G.6, a student who has already completed a bachelor of honours degree at this or another university, may, with the permission of the Dean, register for another degree, subject to the regulations applicable to the field of study in question and to any other stipulations the Dean may prescribe on the condition that there shall be no overlap in the course content of the first degree and the second degree. Such a concession may be withdrawn by the Dean/Deans if the student does not perform satisfactorily.

2. Acknowledgement of modules

2.1. Subject to the stipulations of G.22.1, G.23.2 and the Joint Statute, a Dean may acknowledge modules passed at another tertiary institution or at this University in a department other than that in which the honours study is undertaken for the honours degree – provided that at least half of the required modules for the degree in question are attended and passed at this university.

2.2. If there is overlap in the course content of the degree for which the student wishes to enrol or is enrolled and a degree already conferred, the Dean may not acknowledge any modules that form part of the degree already conferred.

Other programme-specific information

Students choose one of the following two streams:
Economic Statistics or **Survey Statistics**

Examinations and pass requirements

In calculating marks, General Regulation G12.2 applies.
Subject to the provisions of General Regulation G.26, a head of a department determines, in consultation with the Dean

- when the honours examinations in his/her department will take place, provided that:

i. honours examinations which do not take place before the end of the academic year, must take place no later than 18 January of the following year, and all examination results must be submitted to the Student Administration by 25 January; and
ii. honours examinations which do not take place before the end of the first semester, may take place no later than 15 July, and all examination results must be submitted to the Student Administration on or before 18 July.

- whether a candidate will be admitted to a supplementary examination, provided that a supplementary examination is granted, only once in a maximum of two prescribed semester modules or once in one year module;
- supplementary examinations (if granted) cover the same subject matter as was the case for the examinations;
- NB: For the purpose of this provision, the phrase "not sit for an examination more than twice in the same subject" as it appears in General Regulation G.18.2, implies that a candidate may not be admitted to an examination in a module, including a supplementary examination, more than three times.
- the manner in which research reports are prepared and examined in his department.

NB: Full details are published in each department's postgraduate information brochure, which is available from the head of department concerned. The minimum pass mark for a research report is 50%. The provisions regarding pass requirements for dissertations contained in General Regulation G.12.2 apply mutatis mutandis to research reports.

Subject to the provisions of General Regulation G.12.2.1.3, the subminimum required in subdivisions of modules is published in the study guides, which is available from the head of department concerned.

Curriculum: Final year

Minimum credits: 120

All honours students in Statistics/Mathematical Statistics should enrol for STK 796 which is a compulsory but non-credit-bearing module. The satisfactory completion of this module is a prerequisite for embarking on the research component of the degree programme.

Select 2 modules from the list of electives.

Core modules

Introduction to statistical learning 720 (EKT 720)

Module credits	15.00
Service modules	Faculty of Natural and Agricultural Sciences
Prerequisites	RAL 780 or WST 311, 312, 321, 322
Contact time	1 lecture per week, 1 web-based period per week
Language of tuition	Module is presented in English
Department	Statistics
Period of presentation	Semester 2

Module content

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.

Multivariate techniques 720 (MET 720)

Module credits	15.00
Prerequisites	STK 310 and STK 320
Contact time	1 lecture per week
Language of tuition	Module is presented in English
Department	Statistics
Period of presentation	Semester 2

Module content

Estimation: methods of moments and maximum likelihood. Cramer-Rao inequality, mean squared error, loss and risk functions, Bayes estimators. Sufficient statistics, completeness, the exponential class. Tests of statistical hypothesis: power function, critical region and Neyman-Pearson lemma.

Regression analysis 780 (RAL 780)

Module credits	15.00
Service modules	Faculty of Health Sciences Faculty of Natural and Agricultural Sciences
Prerequisites	STK 310 and STK 320
Contact time	1 lecture per week, 1 web-based period per week
Language of tuition	Module is presented in English
Department	Statistics
Period of presentation	Semester 1

Module content

Matrix methods in statistics. Simple and multiple regression models. Sums of squares of linear sets. Generalised t- and F-tests. Residual analysis. Diagnostics for leverage, influence and multicolinearity. Indicator variables. Regression approach to analysis of variance. Weighted least squares. Theory is combined with practical work.

Research report: Statistics 795 (STK 795)

Module credits	30.00
Prerequisites	STK 310, STK 320, RAL 780
Language of tuition	Module is presented in English
Department	Statistics
Period of presentation	Year

Module content

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 under the Department of Statistics: Postgraduate study.

Research orientation 796 (STK 796)

Module credits	0.00
Service modules	Faculty of Economic and Management Sciences
Prerequisites	No prerequisites.
Contact time	Ad Hoc
Language of tuition	Module is presented in English
Department	Statistics
Period of presentation	Year

Module content

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.

Analysis of time series 720 (TRA 720)

Module credits	15.00
Service modules	Faculty of Natural and Agricultural Sciences
Prerequisites	STK 310 and STK 320
Contact time	1 lecture per week
Language of tuition	Module is presented in English
Department	Statistics
Period of presentation	Semester 2

Module content

In this module certain basic topics relating to discrete, equally spaced stationary and non-stationary time series are introduced as well as the identification, estimation and testing of time series models and forecasting. Theoretical results are compared to corresponding results obtained from computer simulated time series.

Elective modules

Macroeconomics 780 (MEK 780)

Module credits	15.00
Service modules	Faculty of Natural and Agricultural Sciences
Prerequisites	Admission into relevant programme
Contact time	1 seminar per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Economics
Period of presentation	Semester 1

Module content

This module will cover the core theoretical concepts of macroeconomics focussing specifically on labour and goods markets as well as intertemporal issues, such as capital markets. Topics will include economic growth, exogenous and endogenous, business cycles, monetary economics, stabilization policies and structural policies.

Microeconomics 780 (MIE 780)

Module credits	15.00
Service modules	Faculty of Natural and Agricultural Sciences
Prerequisites	Admission into relevant programme
Contact time	4 lectures per week
Language of tuition	Module is presented in English
Department	Economics
Period of presentation	Semester 1

Module content

The core concepts of microeconomic theory will be the focus of the module, including: demand and supply, consumer theory, firm theory, markets and market structure, general equilibrium, information economics and behavioural economics. Applications of this theory will feature prominently.

Sampling techniques 720 (SFT 720)

Module credits	15.00
Service modules	Faculty of Natural and Agricultural Sciences
Prerequisites	BScHons: WST 311, WST 312, WST 321, WST 322; BComHons: STK 310, 320
Contact time	1 lecture per week
Language of tuition	Module is presented in English
Department	Statistics
Period of presentation	Semester 1

Module content

Simple random sampling. Estimation of proportions and sample sizes. Stratified random sampling. Ratio and regression estimators. Systematic and cluster sampling. Complex survey methodology. Handling of nonresponse.

Statistical process control 780 (SPC 780)

Module credits	15.00
Service modules	Faculty of Natural and Agricultural Sciences
Prerequisites	STK 310, 320 or WST 311, 312, 321, 322
Contact time	1 lecture per week
Language of tuition	Module is presented in English
Department	Statistics
Period of presentation	Semester 1

Module content

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.