DEPARTMENT OF STATISTICAL SCIENCES
STATISTICS HONOURS PROGRAMMES 2025

GENERAL INFORMATION FOR STUDENTS

Honours Programme Convenors

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Summary of Programmes

The following are the full honours programmes offered in the department:

STA4006W – BCom(Hons) in Statistics
STA4007W – BSc(Hons) in Statistical Sciences
STA4010W – Honours year requirement for BBusSc specialising in Analytics *(4 course credits for the BBusSc curriculum)*

In addition to the above full honours programmes, opportunity is also provided to take a selection of coursework modules from the honours programme, equivalent to either a full- or half-year course:

STA4011W – This requires completion of 10 credits from the honours programmes listed below, and gives credit equivalent to a full fourth-year level course *(2 course credits for BBusSc)*
STA4016H – This requires completion of 6 credits from the honours programmes listed below, and gives credit equivalent to a half fourth-year level course *(1 course credit for BBusSc)*

Notes

At least 14 of 18 credits needs to be done in an honours year and so if a student enrols for the full honours after taking 4011/4016, at most 4 credits (2 modules) can be carried over into the subsequent full honours year. These credits can only be used within 2 subsequent years of completing 4016 or 4011.

Analytics students should clear all courses stipulated in the curriculum (including 3045F) + obtain the minimum average for the appropriate 3rd year STA courses (3041F and 3043S, or 3030F and 3036S) before being admitted into STA4010W.

Basic Programme Structures

Requirements for each programme are expressed in terms of a numbers of credits (which may or may not bear any relationship to the definitions of "credits" used anywhere else in the university!). Broadly speaking, one credit is the equivalent of half of an honours semester module (typically about 12 formal lectures plus associated practical or assignment work) – also see the additional note on internal vs. NQF credits.

Each programme has a set of core modules plus a number of electives to make up a total required number of credits. Students may take more than the required number of electives, and the best of the marks for the required minimum number of electives will be taken into consideration in calculating the final grade. Note, however, that we do cap the number of additional electives that can be taken: 4016/4011 students are allowed to take at most **one** extra module. 4006/4007/4010 students are allowed to take at most **two** extra modules. It is strongly advised that you do not pick up too much work as the honours programme has a very full curriculum as is. There is no cap on the balance of electives in each semester - you can take as many as you like in each provided that you have enough credits for the programme.

Core requirements and the total numbers of credits depend on the programme chosen. The requirements are summarised in the following table.

Core Courses	**Semester**	**Credits**	**STA4006/7W**		**STA4010W**	
			Math Stats	**App Stats**	**Math Stats**	**App Stats**
Project	1+2	6	✓	✓	✓	✓
Statistical Computing	1	2	✓	✓	✓	✓
Matrix Methods	1	1		✓		✓
Multivariate Statistics	1	2	✓	✓	✓	✓
Likelihood Theory	1b	1	✓		✓	
Intro to Stochastic Processes	1b	1		✓		✓
Intro to Bayes	1a	1		✓		✓
Operations Research A	1	2	✓		✓	
Operations Research B	2	2	✓	✓	✓	✓
Analytics (Code: STA4026S)	2	3	✓	✓	✓	✓
Total Core Credits			18	18	18	18
Total Required Credits			24	24	22	22

The total required credits must be made up by selecting additional modules, either from the core list (where these are not already "core" for the relevant programme), or from the list of elective modules offered by the department (typically counting 2 credits each), or from graduate courses in other departments (with the permission of the programme convenor, and subject to the constraint that only **one** course may be taken from another department).

The electives on offer in the department in 2023 (provided that at least 4 students elect to do the module) are as follows:

Module	Semester	Credits	Lecturers
Decision Modelling	2	2	L Scott / G Rakotonirainy
Biostatistics	1	2	F Little / G Distiller
Time Series Analysis	2	2	B Ernie / S Salau
Portfolio Theory (Code: STA4028Z)	1	2	T Gebbie
Bayesian Analysis (Code: STA4027Z)	2	2	A Clark
Applied Spatial Data Analysis	1	2	S Er / S Salau
Advanced Probability (Code: STA4029Z) [1]	1	2	M Mavuso

General Rules and Policies regarding course selection and credits

- Applied students who did not take 3036S during their undergraduate studies will be required to take OR A. OR A will then be accounted for in the final mark calculation as an elective module rather than as a core subject.
- As mentioned above, students may take a single elective module offered in other departments. This is subject to approval of said subject by the honours convenor and the course convenor for said course. Such electives MUST be communicated upon module selection in each semester. Failure to do so will result in the mark attained for such an elective being excluded from results.
- Taking of Masters modules: On rare occasions (contingent on the configuration and circumstances under which a student entered the honours degree), students will be allowed to take Masters modules which may contribute credits towards the honours degree. This may be done only with express permission from the Masters convenors, Honours convenors, and the HoD. The number of credits that such a module may count will be decided in consultation with and at the discretion of the HoD.

A Note on NQF credits vs. Internal Credits

The modules with separate codes count 12 NQF credits, Analytics counts 18. The program is 160 NQF credits in total with 120 to coursework and 40 towards the project. Note, however, that we expect students to do 18 of our internal credits of coursework which is 9 of our 2 credit modules, not 10. This follows since technically they count a bit more than 12 NQF credits (13.33).

Timetable

The honours program follows the same structure as the main academic calendar, except for the fact that we start 1 week early and so have 13 weeks in the first semester. There will be two exam sessions (mid year and at the end of the year).

[1] Only for Maths Stats students

Additional Information and Requirements

1. Attendance at lectures is compulsory and attendance will be monitored. Inform your lecturer in advance if there are compelling reasons why you are unable to attend. Persistent absenteeism without good reason will result in a DPR.

2. We allow students to try an elective for the first two weeks to see what it's about. Subsequently, there will be a fixed date at which students' module choices need to be finalised (see the Honours Academic Activities Calendar). **Selection of modules become binding at that date**. This applies to **all** programmes.

3. You are not allowed to video record a lecturer without their express permission – this applies to video lectures/virtual meetings as well.

4. Any and all media shared by lecturers (recorded lectures, meetings, course notes, assignments, exams, code, etc.) are copyright of the lecturer and UCT. Sharing of such materials is prohibited **BY LAW** (not just the code of conduct at the university to which you have agreed by registering at UCT).

5. Most compulsory and elective modules require students to hand in practical assignments. You can expect one assignment for every 12 lectures (i.e. 2 assignments for a 2 credit module). Timely submission of practical assignments and class exercises by the due dates is a DP requirement. Late submissions will be penalised at the module convenor's discretion. Failure to submit one or more assignments may result in a DPR for the module.

6. Regular research seminars are held in the department, usually during lunchtime on Mondays. Attendance at seminars is a DP requirement for honours students.

7. Printing: You will have access to a departmental printer and may print a maximum of 400 pages during the year without incurring any costs. Your use of the printer will be monitored and you will be required to pay for additional printing once you exceed the 400 page limit.

8. Computer access: Once you are registered, you will have 24-hour access to the honours computer lab via your student card. You may log in to any computer in the honours lab with your student number and network password. The lab is reserved primarily for use by the statistics honours class. Other graduate students or official visitors to the department may also have access to the lab, but *you are not permitted to allow your friends to use these facilities.* Please report strangers to the course convenor immediately. If you are the last person to leave the lab, *make sure that the doors are locked.* Any problems experienced with the computers or printer should be reported to Kevin Jeptha (Kevin.Jeptha@uct.ac.za). Make sure you keep the laboratory clean. Do not leave paper lying around. Do not eat or drink while working at a computer. Do not make a noise. Students violating the above rules will have their access privileges withdrawn.

Projects

The honours project forms an important and substantial part of the programme. In most cases, the project will involve the application of new methods of statistics and/or operations research to non-trivial real world problems. On some occasions, students may be permitted to undertake a project that involves more fundamental research into methods of statistics or operations research.

Projects will be done in groups of two and topics will be allocated to groups by the end of the 1st term. Project topics will be provided by the department after which students will submit a preferred set of topics (ranked). The project convenor will then allocate projects to pairs of students. Note that it is possible for students to work on their own though we usually prioritise working in pairs. Students can bring their own topics, subject to the following conditions: 1) the project topic is floated along with the other project abstracts and thus students can be paired up with you on said project. 2) it is the responsibility of the student to find a person in the department willing to supervise said project.

Please note that you are expected to work continuously on your research project throughout the year (which is why project time has been inserted into your weekly timetables). Importantly, this includes the June/July vacation period! You should therefore avoid making alternative plans (e.g. long holidays away, full-time internships, etc.) over this time. The projects are due by the start of the exam session at the end of the year.

Further information about the projects and the expected outputs will be provided at a later stage. You may also refer to the Honours Project Information guide for details.

Students enrolled for OTHER honours degrees

- CSC Honours: For those wishing to take Analytics, for example, **have to both register and pay** since the CSC honours program has been modularised. For those who wish to take other modules from our course, they need to register under an appropriate code for external modules under the CSC programme. Your convener should be Jan Buys (jan.buys@uct.ac.za).
- Students who are from mathematics may take up to two of our modules provided that they have consulted with their programme conveners, our programme conveners, and the relevant statistics module conveners.

Plagiarism

Plagiarism is to use another person's work and to present it as one's own. This can occur very easily when working in groups, especially in the computer lab while busy with programming assignments. While group work is encouraged, you must make sure that the work that you hand in is your own. So go home and do the final programming and write-up yourself! The easy availability of information on the internet has made

plagiarism much more rife than before. Plagiarism can even occur through the thoughtless downloading of "interesting" material and incorporating this into reports without malicious intent. However, ignorance is no excuse! Plagiarism is intellectual theft and fraud, whether intended or not, and instances of plagiarism which are discovered are dealt with very severely (including expulsion from the University).

For the above reasons, each and every written submission to the Department (projects, reports, assignments, essays) must include the following declaration, which should be signed:

1. I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.
2. Each significant contribution to, and quotation in, this project report from the work of other people has been attributed, and has been cited and referenced.
3. This project is my own work.
4. I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

Signature _____

In order to avoid unintended plagiarism, it is advisable to get into the habit of systematically recording sources of all information retrieved, and of referencing such information whenever used. The UCT writing centre does provide some guidelines to students on referencing conventions. They tend to favour the so-called Harvard style (referencing by author and year), but many technical journals (mathematical and statistical) prefer numbering of references. The styles are illustrated below, showing both how references appear in the text and how the bibliography is listed. Both examples were generated by the BiBTEX utility in LATEX.

Harvard Reference Style Illustrations

The examples here were generated by the LaTeX *natbib* package, using the author-year (allied to the "Harvard-style") referencing option, with the *apalike* bibliographic style.

A standard in-line reference to an article might be as discussed by Stewart et al. (2004), or perhaps as in Lee and Olson (1999) when citing a chapter in a book. Passing or parenthetical references to a string of related papers are also possible (Belton, 1986; Lootsma, 1993; Tversky and Kahneman, 1981; Stewart, 2005).

Similar styles apply to books, where we could refer to the work of Belton and Stewart (2002), but other books might be noted (Eden and Ackermann, 1998; Ignizio, 1976)

References

Belton, V. and Stewart, T. J. (2002). *Multiple Criteria Decision Analysis: An Integrated Approach*. Kluwer Academic Publishers, Boston.

Belton, V. (1986). A comparison of the analytic hierarchy process and a simple multi-attribute value function. *European Journal of Operational Research*, 26:7–21.

Eden, C. and Ackermann, F. (1998). *Making Strategy: The Journey of Strategic Management*. SAGE Publications, London.

Ignizio, J. P. (1976). *Introduction to Linear Goal Programming*. Sage.

Lee, S. M. and Olson, D. L. (1999). Goal programming. In Gal, T., Stewart, T. J., and Hanne, T., editors, *Multicriteria Decision Making: Advances in MCDM Models, Algorithms, Theory, and Applications*, chapter 8. Kluwer Academic Publishers, Boston.

Lootsma, F. A. (1993). Scale sensitivity in the multiplicative AHP and SMART. *Journal of Multi-Criteria Decision Analysis*, 2:87–110.

Stewart, T. J., Janssen, R., and van Herwijnen, M. (2004). A genetic algorithm approach to multiobjective land use planning. *Computers and Operations Research*, 32:2293–2313.

Stewart, T. J. (2005). Goal programming and cognitive biases in decision making. *Journal of the Operational Research Society*, 56:1166–1175.

Tversky, A. and Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211:453–458.

Numbered Reference Style Illustrations

The examples here were generated by the LaTeX *natbib* package, using the numbers referencing option, with the *abbrvnat* bibliographic style.

A standard in-line reference to an article might be as discussed by Stewart et al. [8], or perhaps as in Lee and Olson [5] when citing a chapter in a book. Passing or parenthetical references to a string of related papers are also possible [1, 6, 9, 7].

Similar styles apply to books, where we could refer to the work of Belton and Stewart [2], but other books might be noted [3, 4]

References

[1] V. Belton. A comparison of the analytic hierarchy process and a simple multi-attribute value function. *European Journal of Operational Research*, 26:7–21, 1986.

[2] V. Belton and T. J. Stewart. *Multiple Criteria Decision Analysis: An Integrated Approach*. Kluwer Academic Publishers, Boston, 2002.

[3] C. Eden and F. Ackermann. *Making Strategy: The Journey of Strategic Management*. SAGE Publications, London, 1998.

[4] J. P. Ignizio. *Introduction to Linear Goal Programming*. Sage, 1976.

[5] S. M. Lee and D. L. Olson. Goal programming. In T. Gal, T. J. Stewart, and T. Hanne, editors, *Multicriteria Decision Making: Advances in MCDM Models, Algorithms, Theory, and Applications*, chapter 8. Kluwer Academic Publishers, Boston, 1999.

[6] F. A. Lootsma. Scale sensitivity in the multiplicative AHP and SMART. *Journal of Multi-Criteria Decision Analysis*, 2:87–110, 1993.

[7] T. J. Stewart. Goal programming and cognitive biases in decision making. *Journal of the Operational Research Society*, 56:1166–1175, 2005.

[8] T. J. Stewart, R. Janssen, and M. van Herwijnen. A genetic algorithm approach to multiobjective land use planning. *Computers and Operations Research*, 32:2293–2313, 2004.

[9] A. Tversky and D. Kahneman. The framing of decisions and the psychology of choice. *Science*, 211:453–458, 1981.