



Matrix Methods – Honours 2024

Course Outline

Department of Statistical Sciences
University of Cape Town

Overview

This course covers basic matrix operations, an introduction to linear algebra, and some pertinent applications of matrix methods in statistics. The mathematical principles covered in this course will be relevant in several other honours modules, especially Multivariate Analysis. The module is presented as a pre-course, taking place in the two weeks preceding the start of lectures.

The content covers the following topics:

- Nomenclature and revision of basics
- Determinants
- Inverses
- Matrix rank
- Generalized inverses and linear equations
- Eigenvalues and eigenvectors
- Spectral decomposition and singular value decomposition

Lectures

The module consists of 6 double period lectures, according to the schedule below. Attendance is expected; lectures will not be recorded.

Venue: Hoeri LT1. Lecture 5 in Hoeri LT2. Lecture 6 TBC.

Schedule:

Lecture	Date	Time	Material	Assessment
1	Mon 5 Feb	14:00 - 16:00	Nomenclature and revision of basics	
2	Tue 6 Feb	11:00 - 13:00	Determinants and elementary operators	
3	Wed 7 Feb	11:00 - 13:00	Inverses	
4	Thu 8 Feb	10:00 - 12:00	Matrix rank	
5	Fri 9 Feb	10:00 - 12:00	Generalised Inverses and Linear Equations	Quiz 1 due
6	Mon 12 Feb	11:00 - 13:00	Eigenvalues, Eigenvectors and decomposition	
	Wed 14 Feb			Quiz 2 due
	Fri 16 Feb			Exam



Lecturer

Lecturer	Office (PD Hahn)	Email
Mr Stefan Britz	5.46	stefan.britz@uct.ac.za

Prescribed Textbook

No textbook is prescribed, all the required material will be provided in the form of course notes.

Assessment

The final grade for the course will be based on:

Quiz 1:	10%
Quiz 2:	10%
Final Exam:	80%

The quizzes are due by 23:55 on Friday of the pre-block and Wednesday of week 1, respectively.

The exam will comprise a written 3-hour invigilated exam.

Date: Friday 17 February

Time: TBC

Venue: TBC
