UNISA university of south africa

Student number: 1862-578-9
Date: 2025-09-24

GOVENDER K MR
55 OCEAN RIDGE DRIVE
VERULAM
4339

Dear Student

As requested, a statement is attached.

Yours faithfully

Prof MM Sepota

Acting Registrar

UNIVERSITEIT VAN SUID-AFRIKA
PRETORIA
UNIVERSITY OF SOUTH AFRICA

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

UNISA university of south africa

Student number: 1862-578-9
Date: 2025-09-24

This is to certify that

KUBESHAN GOVENDER

Identity Number :0409085279084
Date of Birth :2004-09-08

passed the university examinations in the undermentioned study units for which credit has been granted in partial completion of the

Bachelor of Science

NQF exit level: 7
Minimum credits required: 360

YEAR	MONTH	CODE	NAME OF STUDY UNIT	%	NQF LEVEL	CREDITS
2023	OCT	APM1513	* Applied Linear Algebra	88	5	12
2023	OCT	APM1514	Mathematical Modelling	60	5	12
2023	OCT	COS1501	* Theoretical Computer Science I	84	5	12
2023	OCT	COS1511	* Introduction to Programming I	78	5	12
2023	OCT	COS1512	* Introduction to Programming II	83	5	12
2023	OCT	COS1521	* Computer Systems: Fundamental Concepts	93	5	12
2023	OCT	MAT1503	Linear Algebra I	59	5	12
2023	OCT	MAT1512	Calculus A	65	5	12
2023	OCT	MAT1613	Calculus B	65	6	12
2025	FEB	APM2611	Differential Equations	59	6	12
2025	FEB	APM2613	Numerical Methods I	58	6	12
2024	OCT	APM2614	* Applied Dynamical Systems	81	7	12
2024	OCT	COS2601	* Theoretical Computer Science II	75	6	12
2024	OCT	COS2611	* Programming: Data Structures	89	6	12
2024	OCT	COS2614	* Programming: Contemporary Concepts	88	6	12
2024	OCT	COS2621	* Computer Organisation	89	6	12
2024	OCT	COS2661	Formal Logic II	71	6	12
2025	FEB	MAT2612	Introduction to Discrete Mathematics	58	6	12
2024	OCT	MAT2615	Calculus in Higher Dimensions	56	6	12

* Passed with distinction

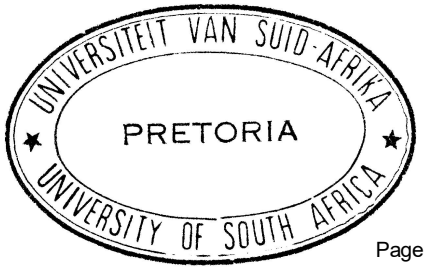
Total credits accumulated: 228

Major subject(s): APPLIED MATHEMATICS
COMPUTER SCIENCE

This qualification is not completed.

Yours faithfully

Acting Registrar



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Purpose statement of modules passed

This is to certify that the purpose statement of the modules offered comprises the following:

APM1513 - Applied Linear Algebra

To enable students to master and apply the following aspects of the numerical solution of systems of linear equations: the method of least squares; linear programming (simplex method); eigenvalues, eigenvectors, diagonalisation as well as some miscellaneous applications.

APM1514 - Mathematical Modelling

To enable students to demonstrate a basic understanding of solution, equilibrium points and stability of difference equations and firstorder differential equations; applications to population models; harvesting strategies; epidemics; economics and other situations; simple optimisation and applications.

APM2611 - Differential Equations

This module will be useful to students interested in developing the basic skills in solving common types of differential equations (DEs) and partial differential equations (PDEs) which can be applied in the natural sciences, engineering and the modelling of physical processes. Students credited with this module will have an understanding of the basic ideas of solving such DEs and PDEs as well as elementary techniques of using Laplace and Fourier transforms and the manipulation of infinite series for this purpose - although the first two mentioned techniques have far-reaching different applications. Students will also have experience in modelling simple physical phenomena using DEs and by solving them will gain an understanding of the process involved.

APM2613 - Numerical Methods I

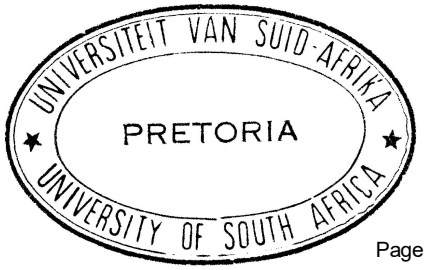
To enable students to understand and use numerical methods in solving scientific and mathematical problems that are difficult to solve analytically. It includes solutions of non-linear equations and systems of linear equations, interpolating polynomials, numerical integration and differentiation, and least-squares approximation. The module requires the use of a computer as a tool to carry out the extensive computations associated with the methods. Hence learners are introduced to the use of relevant computer software to find numerical solutions using various numerical algorithms.

APM2614 - Applied Dynamical Systems

To enable students to master and apply fundamental aspects of discrete and continuous systems including linear systems; phase portraits: equilibrium points, stability, limit cycles; Liapunov stability; elementary control theory as well as applications to mechanics, ecology, economics and elsewhere.

COS1501 - Theoretical Computer Science I

To introduce students to some concepts from Discrete Mathematics as a theoretical foundation for Computer Science. This background is relevant to relational databases, the development of provably correct programs, and the analysis of algorithms.



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COS1511 - Introduction to Programming I

The purpose of the module is to introduce students to programming and to cover the fundamentals of data and control structures, techniques for problem solving and algorithm design, input and output of data from and to the standard input/output streams. Data types and structures which are covered are floating point, integer, character, string, boolean, one and two dimensional arrays. The C++ decision and iteration structures that are covered include if, while, for, switch and do..while. Furthermore, functions with both reference and value parameters are covered, as well as struts.

COS1512 - Introduction to Programming II

To introduce students to the detailed design and implementation of algorithms as programs, and includes the fundamentals of simple data structures with object-orientation.

COS1521 - Computer Systems: Fundamental Concepts

To introduce students to the computer as a system. This covers hardware concepts such as internal representation of numbers and characters and basic computer architecture, and software concepts such as systems software and applications software. It also includes a brief introduction to databases, and to systems analysis and design.

COS2601 - Theoretical Computer Science II

This module together with COS3701 will acquaint students with the capabilities and limitations of computers from a theoretical viewpoint. Module COS2601 covers formal languages, recursive definitions, regular expressions, finite automata, Moore and Mealy machines, transition graphs, the pumping lemma and decision problems.

COS2611 - Programming: Data Structures

To show learners how abstract data types and data structures can be implemented and used in an object-oriented programming language. The module covers recursion, linked lists, dynamic memory allocation, binary trees, and graphs.

COS2614 - Programming: Contemporary Concepts

This module provides qualifying learners with the knowledge, skills and competencies to apply object- oriented programming techniques and strategies in solving real-world problems according to industry- approved processes within South-African and global contexts. The students who complete this module can design and implement object oriented software systems. These abilities prepare qualifying students to be competent programmers that are familiar with structured programming techniques.

COS2621 - Computer Organisation

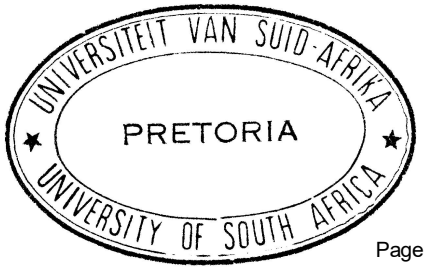
To introduce students to the underlying structure of a modern digital computer, including digital logic level, machine code level and the software system level. It involves programming in an assembly language.

COS2661 - Formal Logic II

To introduce students to the syntax of propositional language and the truth functionality of first order logic, enabling them to deal with proofs for validity via deduction and resolution in an interpreted first-order language.

MAT1503 - Linear Algebra I

This module will be useful to students interested in developing the basic skills in linear algebra which can be applied in the natural sciences and social sciences. Students credited with this module will have an understanding of the basic ideas of linear algebra and be able to apply the basic techniques for handling systems of linear equations, matrices, determinants and vectors as well as complex numbers.



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MAT1512 - Calculus A

This module will be useful to students interested in developing the basic skills in differential and integral calculus which are essential for the physical, life and economic sciences. Students credited with this module will have a firm conceptual grasp of the limit, continuity, differentiation and integration, together with a background in the basic techniques and application of Calculus.

MAT1613 - Calculus B

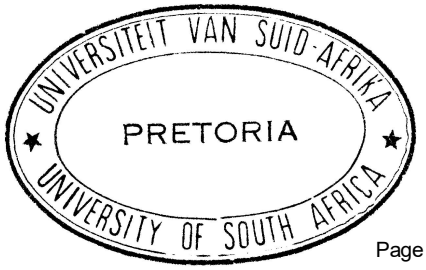
Qualifying students in this module will have mastered the techniques of integral and differential calculus. The techniques developed are fundamental to graph sketching, optimization, related rates, minimum and maximum value problems, definite and indefinite integrals, area and solids of revolution calculations.These techniques and skills support further studies and applications in the sector of applied mathematics, in the field of mathematical sciences, as part of a degree in mathematics, applied mathematics or physics These competencies contribute to the development of scientific knowledge and mathematical understanding in Southern Africa, Africa or globally. Enrolled students in this blended mode are connected to the myUnisa platform on a regular basis throughout the semester.

MAT2612 - Introduction to Discrete Mathematics

To acquaint students with the theory and applications of the following aspects of discrete mathematics: counting principles, relations and digraphs, (including equivalence relations), functions, the pigeonhole principle, order relations and structures (e.g. partially ordered sets, lattices, Boolean algebras), the principle of induction.

MAT2615 - Calculus in Higher Dimensions

The main purpose of this module is to extend concepts such as limits, continuity, differentiation and integration, studied in first year calculus, to functions of several variables. Furthermore, the purpose extends to improve the problem-solving skills of students and to form a basis of knowledge that is necessary for further studies in Mathematics and application in Physics.Also, the purpose is to gain clear knowledge and an understanding of vectors in n-space, functions from n-space to m-space, various types of derivatives (grad, div, curl, directional derivatives), higher-order partial derivatives, inverse and implicit functions, double integrals, triple integrals, line integrals and surface integrals, theorems of Green, Gauss and Stokes.



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