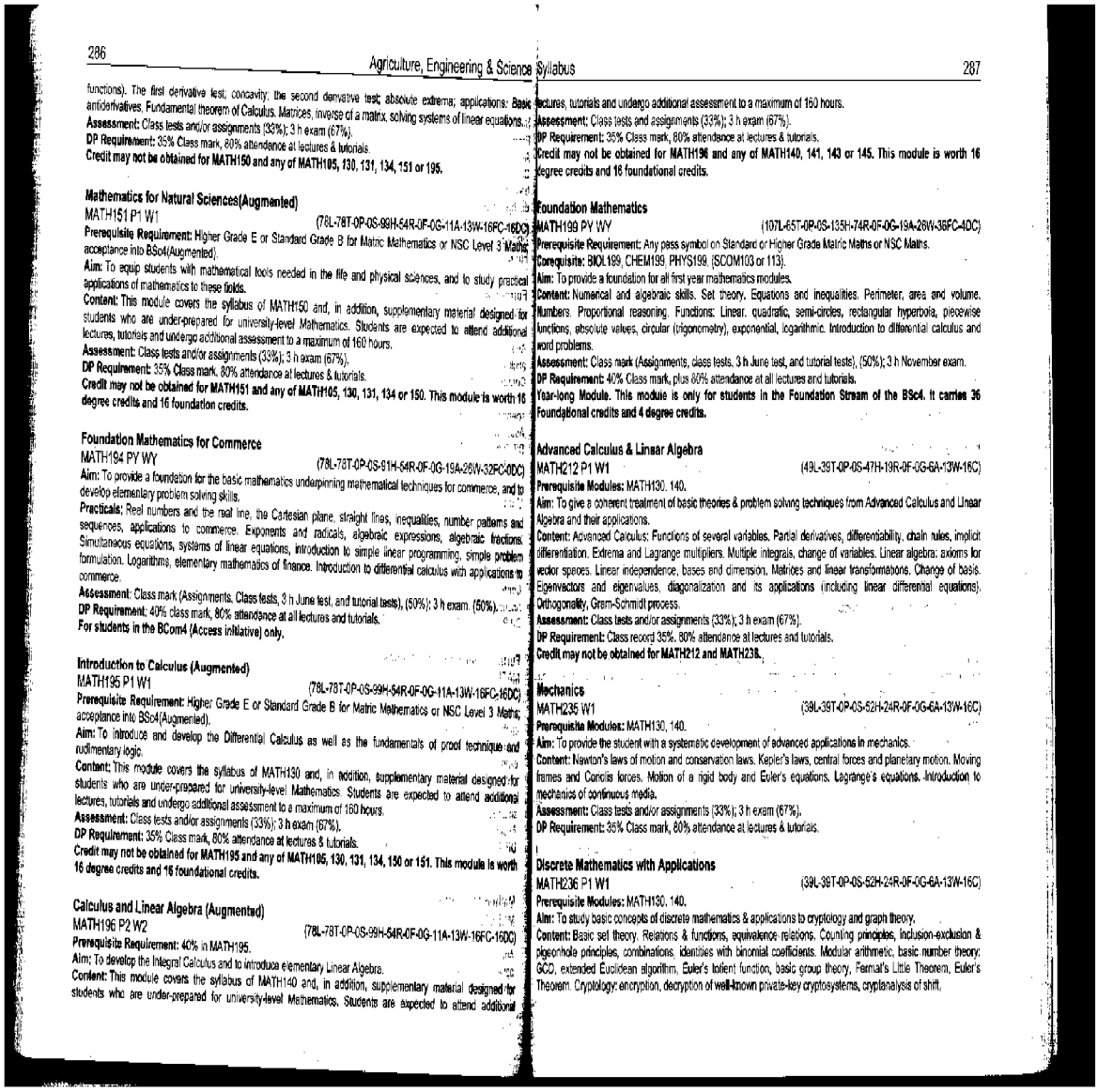
7.26 Annexure 5D: Extract from Handbook showing MATH194 syllabus



functions). The first derivative test; concavity; the second derivative test; absolute extrema; applications: Basic antiderivatives. Fundamental theorem of Calculus. Matrices, inverse of a matrix, solving systems of linear equations.
Assessment: Class tests and/or assignments (33%); 3 h exam (67%).
DP Requirement: 35% Class mark, 80% attendance at lectures & tutorials.
Credit may not be obtained for MATH150 and any of MATH105, 130, 131, 134, 151 or 195.

Mathematics for Natural Sciences(Augmented)
MATH151 P1 W1 (78L-78T-0P-0S-99H-54R-0F-0G-11A-13W-16FC-16DC)
Prerequisite Requirement: Higher Grade E or Standard Grade B for Matric Mathematics or NSC Level 3 Maths; acceptance into BSc4(Augmented).
Aim: To equip students with mathematical tools needed in the life and physical sciences, and to study practical applications of mathematics to these fields.
Content: This module covers the syllabus of MATH150 and, in addition, supplementary material designed for students who are under-prepared for university-level Mathematics. Students are expected to attend additional lectures, tutorials and undergo additional assessment to a maximum of 160 hours.
Assessment: Class tests and/or assignments (33%); 3 h exam (67%).
DP Requirement: 35% Class mark, 80% attendance at lectures & tutorials.
Credit may not be obtained for MATH151 and any of MATH105, 130, 131, 134 or 150. This module is worth 16 degree credits and 16 foundation credits.

Foundation Mathematics for Commerce
MATH194 PY WY (78L-78T-0P-0S-91H-54R-0F-0G-19A-26W-32FC-0DC)
Aim: To provide a foundation for the basic mathematics underpinning mathematical techniques for commerce, and to develop elementary problem solving skills.
Practicals: Real numbers and the real line, the Cartesian plane, straight lines, inequalities, number patterns and sequences, applications to commerce. Exponents and radicals, algebraic expressions, algebraic fractions. Simultaneous equations, systems of linear equations, introduction to simple linear programming, simple problem formulation. Logarithms, elementary mathematics of finance. Introduction to differential calculus with applications to commerce.
Assessment: Class mark (Assignments, Class tests, 3 h June test, and tutorial tests), (50%); 3 h exam. (50%).
DP Requirement: 40% class mark, 80% attendance at all lectures and tutorials.
For students in the BCom4 (Access initiative) only.

Introduction to Calculus (Augmented)
MATH195 P1 W1 (78L-78T-0P-0S-99H-54R-0F-0G-11A-13W-16FC-16DC)
Prerequisite Requirement: Higher Grade E or Standard Grade B for Matric Mathematics or NSC Level 3 Maths; acceptance into BSc4(Augmented).
Aim: To introduce and develop the Differential Calculus as well as the fundamentals of proof technique and rudimentary logic.
Content: This module covers the syllabus of MATH130 and, in addition, supplementary material designed for students who are under-prepared for university-level Mathematics. Students are expected to attend additional lectures, tutorials and undergo additional assessment to a maximum of 160 hours.
Assessment: Class tests and/or assignments (33%); 3 h exam (67%).
DP Requirement: 35% Class mark, 80% attendance at lectures & tutorials.
Credit may not be obtained for MATH195 and any of MATH105, 130, 131, 134, 150 or 151. This module is worth 16 degree credits and 16 foundational credits.

Calculus and Linear Algebra (Augmented)
MATH196 P2 W2 (78L-78T-0P-0S-99H-54R-0F-0G-11A-13W-16FC-16DC)
Prerequisite Requirement: 40% in MATH195.
Aim: To develop the Integral Calculus and to introduce elementary Linear Algebra.
Content: This module covers the syllabus of MATH140 and, in addition, supplementary material designed for students who are under-prepared for university-level Mathematics. Students are expected to attend additional

lectures, tutorials and undergo additional assessment to a maximum of 160 hours.
Assessment: Class tests and assignments (33%); 3 h exam (67%).
DP Requirement: 35% Class mark, 80% attendance at lectures & tutorials.
Credit may not be obtained for MATH196 and any of MATH140, 141, 143 or 145. This module is worth 16 degree credits and 16 foundational credits.

Foundation Mathematics
MATH199 PY WY (107L-65T-0P-0S-135H-74R-0F-0G-19A-26W-36FC-4DC)
Prerequisite Requirement: Any pass symbol on Standard or Higher Grade Matric Maths or NSC Maths.
Corequisite: BIOL199, CHEM199, PHYS199, (SCOM103 or 113).
Aim: To provide a foundation for all first year mathematics modules.
Content: Numerical and algebraic skills. Set theory. Equations and inequalities. Perimeter, area and volume. Numbers. Proportional reasoning. Functions: Linear, quadratic, semi-circles, rectangular hyperbola, piecewise functions, absolute values, circular (trigonometry), exponential, logarithmic. Introduction to differential calculus and word problems.
Assessment: Class mark (Assignments, class tests, 3 h June test, and tutorial tests), (50%); 3 h November exam.
DP Requirement: 40% Class mark, plus 80% attendance at all lectures and tutorials.
Year-long Module. This module is only for students in the Foundation Stream of the BSc4. It carries 36 Foundational credits and 4 degree credits.

Advanced Calculus & Linear Algebra
MATH212 P1 W1 (49L-39T-0P-0S-47H-19R-0F-0G-6A-13W-16C)
Prerequisite Modules: MATH130, 140.
Aim: To give a coherent treatment of basic theories & problem solving techniques from Advanced Calculus and Linear Algebra and their applications.
Content: Advanced Calculus: Functions of several variables. Partial derivatives, differentiability, chain rules, implicit differentiation. Extrema and Lagrange multipliers. Multiple integrals, change of variables. Linear algebra: axioms for vector spaces. Linear independence, bases and dimension. Matrices and linear transformations. Change of basis. Eigenvectors and eigenvalues, diagonalization and its applications (including linear differential equations). Orthogonality, Grem-Schmidt process.
Assessment: Class tests and/or assignments (33%); 3 h exam (67%).
DP Requirement: Class record 35%, 80% attendance at lectures and tutorials.
Credit may not be obtained for MATH212 and MATH238.

Mechanics
MATH235 W1 (39L-39T-0P-0S-52H-24R-0F-0G-6A-13W-16C)
Prerequisite Modules: MATH130, 140.
Aim: To provide the student with a systematic development of advanced applications in mechanics.
Content: Newton's laws of motion and conservation laws. Kepler's laws, central forces and planetary motion. Moving frames and Coriolis forces. Motion of a rigid body and Euler's equations. Lagrange's equations. Introduction to mechanics of continuous media.
Assessment: Class tests and/or assignments (33%); 3 h exam (67%).
DP Requirement: 35% Class mark, 80% attendance at lectures & tutorials.

Discrete Mathematics with Applications
MATH236 P1 W1 (39L-39T-0P-0S-52H-24R-0F-0G-6A-13W-16C)
Prerequisite Modules: MATH130, 140.
Aim: To study basic concepts of discrete mathematics & applications to cryptology and graph theory.
Content: Basic set theory. Relations & functions, equivalence relations. Counting principles, inclusion-exclusion & pigeonhole principles, combinations, identities with binomial coefficients. Modular arithmetic, basic number theory; GCD, extended Euclidean algorithm, Euler's totient function, basic group theory, Fermat's Little Theorem, Euler's Theorem. Cryptology: encryption, decryption of well-known private-key cryptosystems, cryptanalysis of shift.