

Faculty	Natural Sciences		
Home Department	Mathematics and Applied Mathematics		
Module Topic	Integral Calculus and Linear Algebra		
Generic Module Name	Integral Calculus and Linear Algebra 104		
Alpha-numeric Code	MAT104		
NQF Level	5		
NQF Credit Value	15		
Duration	Year		
Proposed semester to be offered	Both semesters		
Programmes in which the module will be offered	BSc (Mathematical and Statistical Sciences) (3227) BSc (Chemical Sciences) (3220) BSc (Physics Sciences) (3233) BSc (Computer Science) (3221)		
Year level	1		
Main outcomes:	<p>On completion of this module students should be able to:</p> <ul style="list-style-type: none"> • Understand the definite integral as a limit of Riemann sums, and the connection between the derivative and the definite integral brought out by the fundamental theorem of calculus. • Apply basic methods of integration. • Use techniques of integration to solve problems. • Understand systems of linear equations as matrix equations and systematic methods for solving matrix equations 		
Main content:	<ul style="list-style-type: none"> • Area and the definite integral, properties of the definite integral, the fundamental theorem of calculus, techniques of integration, numerical methods and improper integrals • Areas under a curve, volumes, arc length and average value of a function • Row-reduced echelon forms and Gauss-Jordan elimination • Solutions of a system of linear equations using determinants (Cramer's rule), and the inverse of a matrix • Vectors, dot product, cross product • Equations of lines and planes in three-dimensional space. • First order Differential equations (variables separable; homogeneous, and linear) and its applications. • While introducing new concepts, emphasis is on the integration and infusion of Pre-Calculus concepts and techniques. 		
Pre-requisite modules	MAT103		
Co-requisite modules	None		
Prohibited module Combination	None		
Breakdown of Learning Time	Hours	Timetable Requirement per week	Other teaching modes that does not require time-table
<i>Contact with lecturer / tutor:</i>	39	<i>Lectures p.w.</i>	3
<i>Assignments & tasks:</i>	15	<i>Practicals p.w.</i>	3
<i>Assessment:</i>	15	<i>Tutorials p.w.</i>	1
<i>Practicals:</i>	39		
<i>Selfstudy:</i>	29		
<i>Other: Please specify</i>	13		

Total Learning Time	150			
Methods of Student Assessment	Continuous Assessment (CA): 50% Final Assessment (FA): 50%			
Assessment Module type	Continuous and Final Assessment (CFA)			