

## Math 1H03

Sub Topic	Pre-requisites	Outcomes and Expectations
1.0 Systems of Linear Equations	Familiarity with manipulating and solving linear equations	Gauss-Jordan elimination, matrix operations, inverse, results on systems of equations and invertibility
2.0 Determinants	Solving quadratic equations	Properties, cofactor expansion, Cramer's rule, basic introduction to eigenvalues and eigenvectors
3.0 Vectors in 2-space and 3-space	Familiarity with vectors and basic trigonometry	Norm, dot product, projections, cross product, lines and planes in 3-space
4.0 Euclidean n-space	Topic 3.0 above	Basic vector operations, distance, length
4.1 Linear Transformations in n-space	Basic knowledge of functions: domain, range composition, one-one	projections, reflections, dilations, rotations, composition, eigenvalues and eigenvectors and properties
5.0 General Vector Spaces	Topic 1.0, 2.0, and 4.1 above	Vector space axioms, subspaces, linear independence, basis and dimension, row space, column space, nullspace, rank and nullity
6.0 Inner Product Spaces	Topics 1.0, 4.0 and 5.0 above	Inner product axioms, angle and orthogonality, Gram-Schmidt process, projections, least squares, change of basis