



## MATHEMATICS 211 "LINEAR METHODS I"

**Calendar Description: H(3-1T-1)**

Systems of equations and matrices, vectors, matrix representations, and determinants.  
Complex numbers, polar form, eigenvalues, eigenvectors. Applications.

**Prerequisite:** A grade of 70% of higher in Pure Mathematics 30.

**Note:** Credit for both Mathematics 211 or 221 and 213 will not be allowed.

### *Syllabus*

<u>Topics</u>	<u>Number of hours</u>
Systems of linear equations, Gauss-Jordan elimination, homogeneous systems, rank	3
Vectors in $\mathbb{R}^2$ and $\mathbb{R}^3$ , dot and cross products, projections, lines, planes, area, volumes	9
Matrix transformations in $\mathbb{R}^2$ , linear transformations	4
Matrix algebra, transpose, inverses, applications to systems of equations	6
Determinants by row reduction and their properties, application to inversion, area	4
Eigenvalues, eigenvectors, diagonalization	4
Polar coordinates, Complex numbers	4
Selected applications (Markov Chains, economic models, least squares approximation, linear programming)	2
<b>TOTAL HOURS</b>	<b>36</b>

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