



**M:** Course Objectives / Learning Outcomes

Upon completion of Math 2232 the student should be able to:

- solve systems of  $n$  equations in  $m$  unknowns using Gauss-Jordan elimination and Gaussian elimination
- prove and apply the basic properties of matrix addition, scalar multiplication, matrix multiplication, the transpose of a matrix and the inverse of a matrix
- express a system of equations as a matrix equation and vice versa
- determine the inverse of a matrix by Gauss-Jordan elimination and use the inverse to find the unique solution of a system of equations
- understand the terms square matrix, symmetric matrix, zero matrix, diagonal matrix, triangular matrix and identity matrix
- evaluate the determinant of an  $n \times n$  matrix
- prove and apply the basic properties of the determinant of a matrix
- understand the terms singular, non-singular and invertible as applied to a matrix
- determine the adjoint of a matrix and use the adjoint to calculate the inverse of a matrix
- solve systems of equations using Cramer's Rule
- prove, apply and explain the basic properties of vector addition and scalar multiplication on the vector space

- determine the characteristic polynomial, eigenvalues and corresponding eigenspaces of a given matrix