

GRANDE PRAIRIE REGIONAL COLLEGE
MA 1020 A3
WINTER 2008

- Title:** Applied Linear Algebra 3.5 (3-1-0) UT 60 Hours
- Transfer:** UA*, UC*, UL*, AU*, CU, KUC (from GPRC Calendar; * indicates important transfer information: see the Alberta Transfer Guide)
- Prerequisite:** MA 1000 or equivalent
- Schedule:** Lecture A3 T R 10:00—11:20 J 226
Seminar AS1 M 12:00—12:50 J 202
- Instructor** Tom McLeister
Office C 204
Phone 539-2989
e-mail tmcleister@gprc.ab.ca
- Office Hours** M W 2:30—4:00
- Textbook** Anton and Rorres Elementary Linear Algebra, Applications Version, 9th Ed.
- Grading:** Worksheets 10%
Quizzes 15%
Midterm 25%
Final Exam 50%
- Worksheets** The worksheets will be done during the seminars
- Quizzes** Quizzes will be held weekly during the Thursday Lecture period.
- Midterm** The Midterm is (tentatively) scheduled for Thursday, Feb 14
- Calculators** Calculators are not permitted on the quizzes or exams

Content

- Ch 1 – Systems of linear equations and matrices
- Introduction to systems of linear equations
 - Gaussian Elimination
 - Matrices and Matrix Operations
 - Inverses; Rules of Matrix Arithmetic
 - Invertibility
 - Diagonal, Triangular, Symmetric Matrices

Ch 2 – Determinants

- The Determinant Function
- Evaluating Determinants by Row Reduction
- Properties of the Determinant Function
- Cofactor Expansion; Cramer's Rule

Ch 3 – Vectors in 2 and 3-Space

- Introduction to Vectors
- Norm of a vector; Vector Arithmetic
- Dot Product; Projections
- Cross Product
- Lines and Planes

Ch 4 – Euclidean Vector Spaces

- Euclidean n-Space
- Linear Transformations (May include parts of Ch 8)

Ch 5 – General Vector Spaces

- Real Vector Spaces
- Subspaces
- Linear Independence
- Basis and Dimension
- Row Space, Column Space, Nullspace
- Rank and Nullity

Ch 6 – Inner Product Spaces

- Orthonormal Bases; Gram-Schmidt Process

Ch 7 – Eigenvalues, Eigenvectors

- Eigenvalues and Eigenvectors
- Diagonalization

Ch 10 – Complex Vector Spaces

- Complex Numbers
- Arithmetic of Complex Numbers
- Polar Form
- Complex Vector Spaces

Ch 9 – Systems of Differential Equations

Ch 11 – Applications of Linear Algebra

- Selected Topics

