

GRANDE PRAIRIE REGIONAL COLLEGE
MATH 1020
WINTER 2005

Title: Engineering Linear Algebra

Prerequisite: MA1000

Schedule:	Lecture A3	M W	8:30-10:00	J229
	Seminar AS1	M	12:00-1:00	J201
	Seminar AS2	M	3:30-4:30	J229

Instructor: Dallas Sawtell
Office C204
Phone 539-2989 e-mail dsawtell@gprc.ab.ca

Textbooks: Anton-Rorres, Elementary Linear Algebra, Applications Version

Grading:	Worksheets	10%
	Quizzes	15%
	Midterm	25%
	Final Exam	50%

Labs/worksheets: The seminars are one hour long. A worksheet will be given out that must be handed in by the end of the seminar for marking.

Quizzes: Quizzes will be held every Wednesday during the last half hour of class starting Wed. Jan 12. Quizzes can not be made up if missed.

Midterm: If the midterm is missed with a good reason, the weight will be put on the final (ie. the final will be worth 75%). A doctors note will be required. The midterm will be on Wed., Feb 16.

Finals: Finals are held from April 16 to April 26 inclusive (including Saturdays and evenings). Writing finals early is not permitted.

Calculators: Use of calculators is not permitted on the quizzes or exams.

Grading Scheme:	A to A+	Excellent
	B+ to A-	Very good
	B to B-	Good
	C- to C+	Satisfactory
	D	Minimal Pass
	F	Fail

Note: A grade of D will NOT meet prerequisite requirements for other math courses and may not be accepted by other universities.

Detailed content:

- Ch 1- Systems of linear equations and matrices
 - Introduction to Systems of Linear Equations
 - Gaussian Elimination
 - Flows and Electrical Circuits (11.2)
 - Matrices and Matrix Operations
 - Inverses; Rules of Matrix Arithmetic
 - Cryptography
 - 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
- Ch3- 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
- 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
- Ch7- Eigenvalues, Eigenvectors
 - Eigenvalues and Eigenvectors
 - Diagonalization
- Ch 10- Complex Numbers
 - Complex numbers
 - Division/Multiplication of Complex Numbers
 - Polar Form of Complex Numbers
- 9.1- Systems of Differential Equations
 - 2nd order and higher homogeneous DEs with constant coefficients, including complex solutions