

GRANDE PRAIRIE REGIONAL COLLEGE
MATH 1020
WINTER 2007

Title: Engineering Linear Algebra (3-1-0) 3 credits

Transfer: UA, UC*, UL*, AU*, CU, KUC (from GPRC Calendar, * important transfer information, consult the Alberta Transfer Guide)

Prerequisite: MA1000

Schedule:	Lecture A3	T Th	10:00-11:30	J226
	Seminar AS1	M	12:00-1:00	J226

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

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

Grading:	Worksheets	13%
	Quizzes	12%
	Midterm	25%
	Final Exam	50%

Seminars/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 other Thursday starting Jan 11. 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 Thurs., Feb 15.

Finals: Finals are held from April 14 to April 24 inclusive (including Saturdays and evenings). Writing finals early is not permitted.

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

Plagiarism: See Calendar

Grading Scheme:	A+	4.0	Excellent
	A	4.0	
	A-	3.7	
	B+	3.3	Good
	B	3.0	
	B-	2.7	
	C+	2.3	Satisfactory
	C	2.0	
	C-	1.7	
	D	1.0	Minimal Pass
F	0.0	Fail	

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

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