THE UNIVERSITY OF WESTERN ONTARIO

APPLIED MATHEMATICS 025b

Course outline

2007-2008

Instructors:

Section 001	M W F	9:30 am – 10:30 am	SEB 1059
Zinovi Krougly		Office: MC 250	email: zkrougly@stats.uwo.ca
Tutorial 003	Tu	2:30 pm – 4:30 pm	SSC 2024
Section 002	M W F	9:30 am – 10:30 am	KB K106
Natalia Kiriushcheva		Office: MC 250	email: nkiriush@uwo.ca
Tutorial 004	Th	10:30 am – 12:30 pm	SSC 2036

Office Hours for Prof. Krougly and Prof. Kiriushcheva:

M W F 10:30 – 11:30 a.m. (or by appointment)

Textbooks:

1. "Elementary Linear Algebra. Applications Version", ninth edition, by Howard Anton and Chris Rorres, John Wiley & Sons, Inc. ISBN 0-471-66959-8. (Required)

2. "Student Solutions Manual", ninth edition, ISBN 0-471-43329-2. (Optional)

Topics:

Systems of Linear Equations: introduction to systems of linear equations, solving systems by Gaussian elimination

Engineering Applications: electrical networks, pipe and traffic flow, data fitting

Matrices: matrix operations, inverses, elementary matrices, special types of matrices

Determinants: cofactor expansion, properties, Cramer's rule

Vector Spaces: definition of a vector space and subspace, linear independence, basis and dimension, row space, column space, nullspace, rank and nullity

Orthogonality: inner product, orthonormal bases, Gram-Schmidt process, least-squares approximations, orthogonal matrices

Topics (cont'd):

Eigenvalues, Eigenvectors: finding eigenvalues and eigenvectors, characteristic polynomial, properties of eigenvalues and eigenvectors, diagonalization, geometric and algebraic multiplicity, similarity, orthogonal diagonalization of real symmetric matrices

Linear transformations: linear mapping between vector spaces, matrix representation of linear transformations

Additional Topics on Applications: data fitting using least-squares solutions, quadratic forms

Grades:

5% First Tutorial Test - week of January 28, 2008

5% Second Tutorial Test - week of February 18, 2008

5% Third Tutorial Test - week of March 24, 2008

35% Midterm examination – Friday, March 7, 2008, 7 p.m. – 9:30 p.m.

50% Final Examination (TBA in the April examination period)

Addendum to all Applied Mathematics Course Outlines

The UWO Senate Academic Handbook has specified that the following points should be added to all course outlines:

1. Plagiarism: Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).

2. Plagiarism Checking: The University of Western Ontario uses software for plagiarism checking. Students may be required to submit their written work and programs in electronic form for plagiarism checking.

3. Prerequisites for a course: Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

4. If computer-marked multiple-choice tests and/or exams are given: Use may be made of software to check for unusual coincidences in answer patterns that may indicate cheating.