LINEAR ALGEBRA (201-NYC-05)
Dawson College - Math Department
SUMMER 08
PONDÉRATION: 3-2-3

PREREQUISITE:
High school or CEGEP functions. Note, however, that the majority of the students who take this course have already passed Calculus I and Calculus II so they exhibit a fair degree of mathematical maturity.

INSTRUCTOR:
Emilie RICHER, ericher@dawsoncollege.qc.ca
OFFICE 7.B.13
Phone: 514-931-8731 EXT 1719

WEBSITE:
The course outline as well as announcements and updates will be posted at
WWW.OBEYMATH.ORG. You should check the website on a regular basis for any information pertaining to the course. For final exams from previous years and other useful information consult the Department Website:
http://dc37.dawsoncollege.qc.ca/math/index.htm

CLASS SCHEDULE:
MON/TUES/THUR 6:00-9:30PM (JUNE 9TH - JULY 28TH)

OFFICE HOURS/EXTRA HELP:
By appointment (please contact me by e-mail). No official office hours will be scheduled, unless otherwise announced.

TEXTBOOK:
The official textbook for the course is:
Elementary Linear Algebra (9th Edition Abridged), by Howard Anton and Chris Rorres, Wiley, ISBN-10: 0-470-83724-1

GRADING SCHEME:
The final grade will be calculated as the best of:
(1) TERM WORK 50% + FINAL 50%
(2) FINAL 100%
NOTE: TO QUALIFY FOR OPTION 2 (100% FINAL) THE STUDENT MUST HAVE OBTAINED AT LEAST 50% ON THE TERM MARK AND WRITTEN 50% OF THE CLASS TESTS/QUIZZES

FOR A SCIENCE 200.XX STUDENT WHO ELECTS TO DO THE COMPREHENSIVE ASSESSMENT IN THIS SECTION, THE ABOVE SCHEME REPRESENTS 90% OF HIS/HER FINAL GRADE. THE ASSESSMENT MAKES UP THE OTHER 10%. **IF A STUDENT FAILS THE ASSESSMENT** (I.E OBTAINS LESS THAN 60%) **HE/SHE CANNOT GRADUATE.**

TERM WORK:
There will be 3 tests (1.5 hours in duration) worth 12% of the final mark each and 4 quizzes (30 minutes in duration) worth 3.5% of the final mark each.
NOTE: TEST AND QUIZ DATES ARE FIXED (SEE DATES BELOW) . THERE WILL BE NO RETESTS. UPON PRESENTATION OF A VALID MEDICAL NOTE THE WEIGHT OF THE MISSED TEST/QUIZ WILL BE TRANSFERRED TO THE WEIGHT OF THE FINAL EXAM

TEST/QUIZ AND FINAL EXAM DATES:

QUIZ 1: Thursday June 12th
TEST 1: Thursday June 19th
QUIZ 2: Thursday June 26th
TEST 2: Thursday July 3rd
QUIZ 3: Thursday July 10th
TEST 3: Thursday July 17th
QUIZ 4: Thursday July 24th
FINAL EXAM: MONDAY JULY 28TH

RELIGIOUS HOLIDAYS:
Students who wish to observe religious holidays must inform each of their teachers in writing within the first two weeks of each semester of their intent to observe the holiday so that alternative arrangements convenient to both the student and the teacher can be made at the earliest opportunity. The written notice must be given even when the exact date of the holiday is not known until later. Students who make such arrangements will not be required to attend classes or take examinations on the designated days, nor be penalized for their absence. It must be emphasized, however, that this College policy should not be interpreted to mean that a student can receive credit for work not performed. It is the student's responsibility to fulfil the requirements of the alternative arrangement.

CALCULATORS:
A calculator without text storage or graphing capabilities is allowed, for class tests and the Final Exam.

LITERACY POLICY:
Problem-solving is an essential component of this course. Students will be expected to analyze problems stated in words, to present their solutions logically and coherently, and to display their answers in a form corresponding to the statement of the problem, including appropriate units of measurement. Marks will be deducted for work which is inadequate in these respects, even though the answers may be numerically correct.

COURSE GOALS:
The main purposes of this course are:
(a) to acquaint the student with the TERMINOLOGY, PROPERTIES, and APPLICATIONS of MATRICES, DETERMINANTS, LINEAR SYSTEMS of EQUATIONS, and VECTORS in THE PLANE and SPACE.
(b) to show how the properties of VECTORS can be utilized in the analysis of LINES and PLANES in 3-space.
(c) to discuss the notions of VECTOR SPACE, SUBSPACE, LINEAR INDEPENDENCE/DEPENDENCE, SPANNING, BASIS and DIMENSION using primarily examples from (1) and (2).
By the completion of the course, the student should be able to solve problems of a computational nature and be able to handle various types of simple proofs.

STUDENTS' OBLIGATIONS:
(a) Students have an obligation to remain informed about what takes place in their regularly scheduled classes. Absence from class does not excuse students from this responsibility.
(b) Students have an obligation to arrive on time and remain for the duration of scheduled classes and activities.
(c) Students have an obligation to write tests and final examinations at the times scheduled by the teacher or the College. Students have an obligation to inform themselves of, and respect, College examination procedures.
(d) Students have an obligation to show respectful behaviour and appropriate classroom deportment. Should a student be disruptive and/or disrespectful, the teacher has the right to exclude the disruptive student from learning activities (classes) and may refer the case to the Director of Student Services under the Student Code of Conduct.
(e) Cellular phones, pagers and musical listening devices have the effect of disturbing the teacher and other students. All these devices should be turned off. Students who do not observe these rules will be asked to leave the classroom.
(f) Cell phones must also be put away. Text messaging is not allowed in class.
Policy on Cheating and Plagiarism

CHEATING IN EXAMINATIONS, TESTS, QUIZZES:

Cheating includes any dishonest or deceptive practice relative to formal final examinations, in-class tests, or quizzes. Such cheating is discoverable during or after the exercise in the evaluation process by the instructor. Such cheating includes, but is not limited to

a. copying or attempting to copy another's work.
b. obtaining or attempting to obtain unauthorized assistance of any kind.
c. providing or attempting to provide unauthorized assistance of any kind.
d. using or possessing any unauthorized material or instruments which can be used
as information storage and retrieval devices.
e. taking an examination, test, or quiz for someone else.
f. having someone take an examination, test, or quiz in one's place.

UNAUTHORIZED COMMUNICATION:

Unauthorized communication of any kind during an examination, test, or quiz is forbidden and subject to the same penalties as cheating.

PLAGIARISM ON ASSIGNMENTS AND THE COMPREHENSIVE ASSESSMENT:

Plagiarism is the presentation or submission by a student of another person's assignments or Comprehensive Assessment as his or her own. Students who permit their work to be copied are considered to be as guilty as the plagiarizer.

OBLIGATION OF THE TEACHER:

Every instance of cheating or plagiarism leading to a resolution that impacts on a student's grade must be reported by the teacher, with explanation, in writing to the Chair of Mathematics and to the Dean of Pre-University Studies. A copy of this report must also be given to the student.

PENALTIES:

Cheating and plagiarism are considered extremely serious academic offences. Action in response to an incident of cheating and plagiarism is within the authority of the teacher. Penalties may range from zero on a test, to failure of the course, to suspension or expulsion from the college.

REFERENCES/ADDITIONAL SOURCES:

1) Linear Algebra with Applications, by W.K. NICHOLSON.
2) Linear Algebra, by S. GROSSMAN.
3) Elementary Linear Algebra, by B. KOLMAN.
4) Linear Algebra - Ideas and Applications by R.C. PENNEY.

AVAILABLE IN THE DAWSON BOOKSTORE:
5) Elementary Linear Algebra, by R.M. McKENZIE.
6) Problem Assignments, by S. PHULL.
7) Linear Algebra Problem Sets Plus, by I. GOMBOS.

COURSE TOPICS & HOMEWORK

CHAPTER 1 - SYSTEMS OF LINEAR EQUATIONS (2 WEEKS)

TOPICS	HOMEWORK EXERCISES
• Solving systems of linear equations using Gaussian and Gauss-Jordan elimination • Properties of matrices and matrix algebra • Definition of matrix inverse • Properties of elementary matrices, finding matrix inverses • Theorems on invertibility and solutions of systems • Diagonal, triangular, and symmetric matrices	• Section 1.1 #1-14 • Section 1.2 #1-18, 22, 31, 32 • Section 1.3 #1-8, 18, 25, 31, 32 • Section 1.4 #1-8, 11, 14-17, 20-22, 31, 32 • Section 1.5 #1-7, 10-12, 17-19, 22, 23 • Section 1.6 #1, 3, 4, 8, 9, 11, 12, 16-19, 21 • Section 1.7 #1-9, 15, 16a, 18, 22, 23, 30 • Supplementary Exercises #6, 7, 9, 11, 14, 18-20

CHAPTER 2 - THE DETERMINANT FUNCTION (1 WEEK)

TOPICS	HOMEWORK EXERCISES
• Evaluating determinants by cofactor expansion • The adjoint of a square matrix, finding inverses using the adjoint • Solving systems of linear equations using Cramer's Rule • Evaluating determinants by row reduction • Investigating properties of the determinant function	• Section 2.1 #1-12, 16-21, 25, 27 • Section 2.2 #1-14, 19, 20 • Section 2.3 #1-7, 12, 16, 18, 20, 21 • Supplementary Exercises #3, 7, 8, 12, 13

CHAPTER 3 - VECTORS (1.5 WEEKS)

TOPICS	HOMEWORK EXERCISES
• The geometric definition of a vector, component notation for a vector • Norm of a vector, vector arithmetic • The dot product: vector projections and applications • The cross product: properties and applications • The scalar triple product and applications • Lines and planes in space • Distance between two skew lines • Closest point on a plane to a point and closest point on a line to a point	• Section 3.1 #1-6 • Section 3.2 #1-6 • Section 3.3 #1-19, 27, 29, 31 • Section 3.4 #1-19, 21, 24 • Section 3.5 #1-44

CHAPTER 5 - VECTOR SPACES (1.5 WEEKS)

TOPICS	HOMEWORK EXERCISES
• Vector space axioms, some properties of vectors • Subspaces, linear combinations of vectors, spanning • Linear Independence • Basis and Dimension	• Section 5.1 #1-15 • Section 5.2 #1-3, 5-11, 14-19, 23, 24 • Section 5.3 #1-10 • Section 5.4 #1-5, 12-19